

Memorandum of Understanding

for Maintenance and Operation of the CMS Detector

between

The EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH,
hereinafter referred to as CERN, Geneva, as the Host Laboratory

on the one hand

and

a Funding Agency / Institution of the CMS Collaboration

on the other hand.

Preamble

- (a) A group of Institutes from CERN Member and non-Member States, and CERN, has agreed to collaborate to form the CMS Collaboration. This Collaboration has proposed to CERN an experiment to study particle interactions at the highest possible energies and luminosities to be reached with the Large Hadron Collider (LHC). These Institutes have secured the support of their Funding Agencies to enable them to participate in the CMS Collaboration.
- (b) Agreement to this Collaboration has been effected through the signature of Memoranda of Understanding (RRB CMS-D 98-31) between each Funding Agency or Institute, as appropriate, in the Collaboration and CERN as the Host Laboratory. These Memoranda of Understanding for construction (Construction MoUs) collectively define the Collaboration and its objectives, and the rights and obligations of the collaborating Institutes in construction matters during the construction period.
- (c) In their Article 6.5, the Construction MoUs specify that the responsibilities for the maintenance and operation (M&O) of the CMS detector are to be laid down in a separate Memorandum of Understanding on maintenance and operation procedures (M&O MoU), to be signed by all the Parties. Agreement is effected as for construction, i.e. through Memoranda of Understanding between each Funding Agency or Institute, as appropriate, in the Collaboration and CERN as the Host Laboratory. While the Construction MoUs remain valid, their provisions take precedence over those of the M&O MoUs.
- (d) The Resources Review Board (RRB) referred to in Preamble (g) of the Construction MoU is defined therein to have the following roles with respect to M&O:
 - reaching agreement on a maintenance and operation procedure and monitoring its functioning

- endorsing the annual maintenance and operation budgets of the detector

The management of the Collaboration reports regularly to the RRB on technical, managerial, financial and administrative matters, and on the composition of the Collaboration.

- (e) The present M&O MoUs are not legally binding, but the Funding Agencies and Institutes recognise that the success of the experiment depends on all members of the Collaboration adhering to their provisions. Any default will be dealt with in the first instance by the Collaboration and if necessary then by the RRB.

Article 1 : Annexes

- 1.1 All the Annexes are an integral part of this MoU.
- 1.2 Annexes 1, 2, 4, 5 and 6 shall be identical to Annexes 1, 2, 3, 5 and 6 (including any amendments thereto) of the Construction MoU. When the latter ceases to be valid, amendments to these Annexes shall be made in accordance with the provisions of this M&O MoU.

Article 2 : Parties to this MoU

- 2.1 The Parties shall be all the Institutes of the Collaboration as listed in **0** and their Funding Agencies, and CERN as the Host Laboratory. **Annex 2** lists the Funding Agencies and their duly authorised representatives. The Funding Agency may be an Institute or an established institution acting on behalf of one or more Institutes.
- 2.2 The collaborating Institute(s) and the CMS Collaboration will hereinafter be referred to as "Institute(s)" and "Collaboration", respectively.

Article 3 : Purpose of this MoU

- 3.1 This MoU addresses the pre-exploitation and exploitation phases of the CMS detector. Its purpose is to define the procedure for determining the maintenance and operation (M&O) costs in these phases along with the mechanisms by which they are reviewed and by which the charges and responsibilities for the execution of this work are distributed amongst the Parties. It sets out organisational, managerial and financial guidelines to be followed by the Collaboration. It does not address the offline computing needs of the Collaboration. These will be the subject of a separate Memorandum of Understanding for LHC Computing as described in the document "Proposal for Building the LHC Computing Environment" (CERN/3279 Rev.).
- 3.2 Exploitation refers to the time after data-taking for physics has commenced at the LHC. Pre-exploitation refers to the time before this and in particular, for individual sub-detector/system components of the CMS detector, to the time after they have been commissioned.
- 3.3 M&O comprises all of the actions needed to fulfil the CMS Collaboration co-ordination function and to operate and keep in good working order the individual

components of the CMS detector, along with their respective infrastructure and facilities.

- 3.4 The CMS project is executed in the normal framework of the CERN scientific programme, approved by the CERN Council and subject to the bilateral Agreements and Protocols between CERN and non-Member States.
- 3.5 In case of conflict between relevant Co-operation Agreements or Protocols entered into by CERN and the present MoU, the former prevail.

Article 4 : Duration of this MoU and its Extension

- 4.1 The initial period of validity of this MoU covers the pre-exploitation phase of the CMS detector and the expected first five years of physics running, i.e. from 1 May 2002 to 31 December 2011.
- 4.2 The validity of this MoU will be extended automatically at its expiry for successive periods of five years beyond the initial period unless the RRB determines otherwise. This provision notwithstanding, the MoU will automatically cease to be valid when the LHC programme is declared closed by the CERN Council.
- 4.3 The provisions of this MoU will apply to elements of the CMS detector as they begin to incur M&O costs, as distinct from the costs that belong to the construction phase and are defined in Article 2.2 of the Construction MoU.
- 4.4 Any Funding Agency may withdraw its support from the Collaboration by giving not less than eighteen months notice in writing to the Collaboration and the Director General of CERN. In such an event, reasonable compensation to the Collaboration will be negotiated through CERN and confirmed by the RRB.
- 4.5 Any Institute may withdraw from the Collaboration according to the procedures agreed by the Collaboration, subject to the General Conditions for Experiments Performed at CERN (**Annex 3**), and by giving notice in writing to its Funding Agency.
- 4.6 Any Institute that joins the Collaboration in accordance with the Collaboration rules during the period of validity of this MoU shall accept the agreements in force and will be expected to make an appropriate contribution to the M&O. This will be negotiated by the Collaboration (which reserves the right to request additional contributions from such Institutes) and endorsed by the RRB.

Article 5 : The CMS Detector and Collaboration

- 5.1 The detector for the CMS experiment has been described in detail in the Technical Proposal submitted to the LHCC in December 1994 and in the subsequent sub-detector/system Technical Design Reports. It consists of a number of sub-detector/system units as listed in **Annex 4**.
- 5.2 The current management structure of the Collaboration is described in **Annex 5**.
- 5.3 The technical participation of the Institutes in detector construction, grouped by Funding Agency, is set out in **Annex 6**.

- 5.4 The Collaboration shall update Annexes 5 and 6 annually to reflect the situation on 1 January of the current year.

Article 6 : Responsibilities of the Institutes for the Maintenance and Operation of the CMS Detector, and of CERN as Host Laboratory

- 6.1 Responsibility for the M&O of the CMS detector rests jointly with the Collaboration as a whole and with CERN as Host Laboratory, within the General Conditions for Experiments Performed at CERN. It is a fundamental principle that each Institute within the Collaboration shall participate in both maintenance and operation and contribute a fair and equitable share of common costs.
- 6.2 It is also a fundamental principle that an Institute, which has contributed a component of equipment, will also contribute to the necessary scientific and technical manpower support to operate that component and maintain it in good working order.
- 6.3 Within the fundamental principles set out in Articles 6.1 and 6.2 above, the Collaboration shall, for each M&O cost item, decide whether the cost is to be borne at the common expense of the Collaboration or not. The M&O cost items are thereby divided into two categories:
- 6.3.1 Common Items, comprising those costs that the Collaboration has agreed to bear at its common expense, and
- 6.3.2 Sub-detectors/systems that are the responsibility of individual Institutes or groups of Institutes.
- 6.4 **Annex 7** lists the M&O cost items agreed by the Collaboration to be Common Items.
- 6.5 **Annex 8** lists for the second category, by sub-detector/system, the deliverables provided by the Institutes, the CORE value of these deliverables and the sharing among Institutes. Also summarised are the CORE values of the deliverables for particular sub-detectors/systems by Funding Agency.
- 6.6 The general obligations of CERN in its role as Host Laboratory and of the Institutes (including CERN in this role) are contained in the General Conditions for Experiments Performed at CERN (Annex 3), which in case of contradiction or ambiguity shall prevail over the main body of this MoU.

Article 7 : Maintenance and Operation Categories

- 7.1 The M&O expenses can be divided into the following three categories:
- 7.1.1 **Category A.** M&O expenses that are shared by the entire Collaboration (cf. Article 6.3.1 above). **Annex 9** lists the headings under which Category A costs are categorised.
- 7.1.2 **Category B.** M&O expenses that are borne by part of the Collaboration, i.e. by single Institutes or groups of Institutes, and their Funding Agencies (cf. Article 6.3.2 above). The headings in this category are defined with reference to the distribution of responsibilities amongst the various Institutes for the

construction of the CMS Detector as given in Annex 8. **Annex 10** lists the headings under which Category B costs are categorised and the Institutes concerned.

It is agreed that an Institute having responsibility under a Category B heading will contribute to providing the necessary financial, scientific and technical support, as well as replacement or spare parts, for normal operation of that equipment and for the routine maintenance needed to keep it in good working order. If problems arise that require major modifications, responsibility will lie with the Collaboration as a whole. The Collaboration will propose on a case-by-case basis the events to which this provision will apply. The proposal will be submitted for approval to the next RRB meeting, which will also be asked to approve the provision of the necessary resources.

- 7.1.3 **Category C.** General maintenance and operation expenses that are provided to the Collaboration by CERN, acting in its role as Host Laboratory. Subject to the General Conditions for Experiments Performed at CERN (Annex 3), these are more precisely described in the list given in **Annex 11**.

Article 8 : Approval and Oversight

- 8.1 Oversight of the M&O costs for the CMS detector shall lie with the RRB, which will meet normally twice per year, in spring and autumn. The RRB shall have the responsibility for approving the levels and sharing of the Category A costs. It shall also approve the overall level of Category B costs and the sharing of these costs as proposed by the Collaboration.
- 8.2 The RRB shall be assisted in this aspect of its work by a Scrutiny Group that it shall appoint. The role of the Scrutiny Group is to analyse critically the Collaboration's M&O reports and estimates, refine the Category A estimates in consultation with the Collaboration and advise the RRB on the course of action to take.
- 8.3 The Scrutiny group shall operate according to the procedures set out in **Annex 12**.

Article 9 : Cost Sharing

- 9.1 Subject to exceptions that may be agreed on a case-to-case basis by the RRB, the following guidelines are agreed for the sharing of M&O costs:
- 9.2 For Category A, the costs are to be shared amongst the Funding Agencies or Institutes in proportion to the number of their scientific staff holding PhD or equivalent qualifications who are entitled to be named as authors of scientific publications of the Collaboration. To this end, the Collaboration shall maintain a list, by Funding Agency and Institute, of these persons (**Annex 13**). The Collaboration shall update this list annually to reflect the situation on 30 September. The updated list is to be ready in time for the autumn meeting of the RRB (see Article 10.1 below).
- 9.3 Funding Agencies or their Institutes must normally pay their share of Category A costs in cash. In exceptional circumstances some of the Category A costs could eventually be paid in kind with the agreement of the RRB, subject always to a minimum fixed cash amount per Institute. In such cases the cash value attributed to

the in-kind contribution shall also be agreed by the RRB. The Collaboration shall propose annually to the RRB the minimum fixed cash amount to be applied in the following year.

- 9.4 CERN will pay from its operating budget the energy costs falling on Member States. In recognition of the contributions made to the construction of the LHC machine by some non-Member States, CERN will treat these countries in a manner analogous to Member States and will partially pay the energy costs that fall on their Funding Agencies and Institutes.

The non-Member States for which CERN will partially pay the energy costs are listed in **Annex 14**.

CERN Management shall propose annually in its Medium Term Plan (The Scientific Activities of CERN and Budget Estimates for the Years $n - n+3$) the overall size of these energy payments for the following year, so that they may be incorporated in the M&O budget presented to the RRB for approval in October. The payments are shared amongst the countries concerned according to a formula, the current version of which is explained in **Annex 15**. Any modifications to the arrangements for these payments will also be proposed in the context of the Medium Term Plan.

- 9.5 For Category B, the costs are to be shared by the Funding Agencies and Institutes concerned in a manner that the Collaboration shall propose to the RRB.
- 9.6 For Category C, the costs are paid by CERN from its operating budget.
- 9.7 The boundary between Category A and Category B costs is determined by the Collaboration as explained in Article 6.3 above. Category C costs are determined by the CERN Director General, having regard to the General Conditions for Experiments Performed at CERN and, in particular, the need to provide a safe and secure environment for the operation of the CMS detector.

Article 10 : Procedure

- 10.1 Proposals for providing and sharing Category A M&O costs according to the criteria set out in Article 9 above, including the proposal for the minimum fixed cash amount per Institute, will be drawn up annually by the Collaboration and submitted to the RRB at its spring meeting. At the same meeting, the Collaboration will report on Category B costs and on the proposed responsibilities and commitments for these, while CERN will report on Category C costs. The information for all Categories will comprise the M&O expenses for the previous year and the proposals for the following year, along with estimates for the three subsequent years. The Scrutiny Group will then operate during the summer, with the aim of agreeing the estimates for Category A for the following year, so that they can be endorsed at the autumn meeting of the RRB. It will also make critical comment on the arrangements for Category B costs.
- 10.2 The RRB will approve the M&O budget for the following year at its autumn meeting.
- 10.3 Unless explicitly mentioned, all proposals and estimates are to be expressed in Swiss Francs, using the calculated CERN index for materials cost variations.

- 10.4 For Category A expenses, a common Maintenance and Operation account (M&O Account) will be opened in the name of the Collaboration. All payments made by CERN on behalf of the Collaboration and the related receipts will be shown in that account.
- 10.5 CERN will issue invoices in Swiss Francs to the Funding Agencies of the Collaboration for their M&O contributions. The detailed procedure for the payment of Category A contributions is set out in **Annex 16**.
- 10.6 For Category A, the Resource Manager (see Annex 5) and other named individuals as necessary will be authorised by the Collaboration to sign commitments and payments relating to the above-mentioned account within the limits of the agreed annual budget for Category A. The authorised signature levels for these persons will be subject to the standard CERN rules for Team Accounts.
- 10.7 The Resource Manager shall report annually to the autumn meeting of the RRB on the functioning of the M&O arrangements for Categories A and B, and shall point out any cases of default (see Article 12.3 below). At the same meeting CERN Finance Division shall report on the status of the Collaboration accounts for Category A and those parts of Category B for which accounts exist at CERN.
- 10.8 If, for any reason, the RRB should fail to reach agreement on the M&O costs or on their sharing, the arrangements that it last agreed will continue to apply until agreement is reached.

Article 11 : Rights and Benefits of Institutes

- 11.1 The Institutes participating in the Collaboration are entitled to join the pre-exploitation and exploitation phases of the project and to participate in the scientific exploitation of the data acquired. Further details are set out in the document "General Conditions for Experiments Performed at CERN" (Annex 3).

Article 12 : Administrative and Financial Provisions

- 12.1 General financial matters and purchasing rules and procedures for the LHC experiments, including the rules that apply for Common Fund operations, are dealt with in accordance with the "Financial Guidelines for the LHC Collaborations" (CERN/FC/3796).
- 12.2 Under the provisions of the CERN basic Convention dated 1st of July 1953 and revised on 17 January 1971, any Institute's staff and property located at CERN shall be subject to the authority of the CERN Director-General and shall comply with the CERN regulations.
- 12.3 Default on provision of the agreed contributions for M&O shall engage the procedure for resolution of disputes described in Article 14.1 below and may result in specific action against the defaulter. Should the outcome of the dispute resolution procedure imply a loss of M&O contributions to the Collaboration, the question of recovery from the loss is for the RRB to address.

Article 13 : Amendments

- 13.1 The Collaboration will make every effort to ensure that the information contained in the Annexes to this MoU is kept up-to-date. To this end it shall review the information at least annually in time for the autumn meeting of the RRB.
- 13.2 This MoU may be amended at any time with the agreement of its signatories or of their appointed successors. Any such amendments will be subject to the prior agreement of the RRB.

Article 14 : Disputes

- 14.1 As indicated in the Preamble (e), the primary mechanism for resolution of any disputes shall be negotiation within the Collaboration in the first instance and then if necessary in the RRB. Should these fail to conclude, the following three mechanisms shall apply, as appropriate. Any dispute between Funding Agencies shall be resolved by negotiation or, failing that, by arbitration through the President of the CERN Council, who will use defined arbitration procedures where they exist and will otherwise adopt one at his or her discretion. Any dispute between a Funding Agency and CERN will be resolved using standard CERN procedures for the resolution of such disputes. Any dispute between Institutes will be resolved according to Collaboration procedures.
- 14.2 It is understood that any issues that have arisen during the lifetime of the Construction MoU shall be without prejudice to the rights and obligations laid down in this M&O MoU. No party shall be entitled under this M&O MoU to reduce, retain or set-off any obligation due under the Construction MoU

Annex 1: Institutes in the Collaboration and Names of their Contact Persons.

| Country/ Region | Code | Institute | Contact Person |
|-----------------|------|----------------------------------------------------------------------------------------------------------------------|---------------------------|
| Armenia | AR1 | Yerevan Physics Institute | Sirunyan, Albert |
| Austria | AT1 | Institut für Hochenergiephysik | Dragicevic, Marko |
| Belarus | BY1 | Byelorussian State University | Suarez Gonzalez, Juan |
| | BY2 | Institute for Nuclear Problems | |
| | BY4 | Research Institute of Applied Physical Problems | |
| Belgium | BE1 | Universite Catholique de Louvain | Lemaitre, Vincent |
| | BE2 | Universite de Mons | Daubie, Evelyne |
| | BE3 | Universite Libre de Bruxelles | Vanlaer, Pascal |
| | BE4 | Universiteit Antwerpen | Van Mechelen, Pierre |
| | BE5 | Vrije Universiteit Brussel | D'Hondt, Jorgen |
| | BE6 | Ghent University | Tytgat, Michael |
| Brazil | BR1 | Universidade do Estado do Rio de Janeiro | Santoro, Alberto |
| | BR2 | Centro Brasileiro de Pesquisas Fisicas | Alves, Gilvan |
| | BR3 | Universidade Estadual Paulista (a), Universidade Federal do ABC (b) | Novaes, Sergio |
| Bulgaria | BG1 | Institute for Nuclear Research and Nuclear Energy | Sultanov, Georgi |
| | BG2 | University of Sofia | Litov, Leandar |
| CERN | CERN | CERN, European Organization for Nuclear Research, Geneva, Switzerland | Camporesi, Tiziano |
| China | CN1 | Institute of High Energy Physics | Chen, Hesheng |
| | CN2 | University for Science and Technology of China | Zhang, Zi-ping |
| | CN3 | State Key Laboratory of Nuclear Physics and Technology, Peking University | Mao, Yajun |
| | CN4 | Beihang University | Chengping, Shen |
| | CN5 | Tsinghua University | Wang, Yi |
| | CN6 | Sun Yat-sen University | You, Zhengyun |
| Colombia | CO1 | Universidad de Los Andes | Avila, Carlos |
| Croatia | CR1 | University of Split, FESB | Puljak, Ivica |
| | CR2 | University of Split, Faculty of Science | Kovac, Marko |
| | CR3 | Institute Rudjer Boskovic | Brigljevic, Vuko |
| Cyprus | CY1 | University of Cyprus | Razis, Panos |
| Czech Republic | CZ1 | Charles University, Prague | Finger, Miroslav |
| Ecuador | EC1 | Escuela Politecnica Nacional | Ayala, Edy |
| | EC2 | Universidad San Francisco de Quito | Carrera Jarrin, Edgar |
| Egypt | EG1 | Academy of Scientific Research and Technology of the Arab Republic of Egypt, Egyptian Network of High Energy Physics | Khalil, Shaaban |
| Estonia | EE1 | National Institute of Chemical Physics and Biophysics | Raidal, Martti |
| Finland | FI1 | Department of Physics, University of Helsinki | Voutilainen, Mikko |
| | FI2 | Helsinki Institute of Physics | |
| | FI7 | Lappeenranta University of Technology | |
| France | FR1 | Laboratoire Leprince-Ringuet, Ecole Polytechnique, CNRS-IN2P3, Université Paris - Saclay | Sirois, Yves |
| | FR3 | IRFU, CEA, Université Paris-Saclay, Gif-sur-Yvette | Besancon, Marc |
| | FR4 | Institut Pluridisciplinaire Hubert Curien, Université de Strasbourg, Université de Haute Alsace Mulhouse, CNRS/IN2P3 | Bloch, Daniel |
| | FR5 | Université de Lyon, Université Claude Bernard Lyon 1, CNRS-IN2P3, Institut de Physique Nucléaire de Lyon | Bernet, Colin |
| | FR6 | Centre de Calcul de l'Institut National de Physique Nucleaire et de Physique des Particules, CNRS/IN2P3 | Gadrat, Sebastien |
| | FR7 | Université de Lyon, Université Claude Bernard Lyon 1, CNRS-IN2P3, Institut de Physique Nucléaire de Lyon | Bernet, Colin |
| Georgia | GE1 | Tbilisi State University | Tsamalaidze, Zviadi |
| | GE2 | Georgian Technical University | |
| Germany | DE2 | KIT, Institut für Experimentelle Teilchenphysik | Müller, Thomas |
| | DE3 | RWTH Aachen University, I. Physikalisches Institut B | Feld, Lutz |
| | DE4 | RWTH Aachen University, III. Physikalisches Institut A | Hebbeker, Thomas |
| | DE5 | RWTH Aachen University, III. Physikalisches Institut B | Stahl, Achim |
| | DE6 | University of Hamburg | Schleper, Peter |
| | DE7 | Deutsches Elektronen-Synchrotron (DESY) | Gallo, Elisabetta |
| | DE8 | University of Bonn | Wittmann, Ralf |
| Greece | GR1 | Institute of Nuclear and Particle Physics (INPP), NCSR Demokritos | Loukas, Demetrios |
| | GR2 | National and Kapodistrian University of Athens | Sphicas, Paraskevas |
| | GR3 | University of Ioannina | Fountas, Konstantinos |
| | GR4 | National Technical University of Athens | Tsipolitis, Georgios |
| Hungary | HU1 | Wigner Research Centre for Physics | Sikler, Ferenc |
| | HU2 | University of Debrecen | Ujvari, Balazs |
| | HU3 | Institute of Nuclear Research ATOMKI | Molnar, Jozsef |
| | HU4 | MTA-ELTE Lendület CMS Particle and Nuclear Physics Group, Eötvös Loránd University | Pasztor, Gabriella |
| | HU5 | Eszterházy Károly University (EKE) | Tamás Novák/Tamás Csörgő |
| India | IN1 | Bhabha Atomic Research Centre | Pant, Lalit Mohan |
| | IN2 | Panjab University | Kaur Lal, Manjit |
| | IN3 | Tata Institute of Fundamental Research-A | Aziz, Tariq |
| | IN5 | University of Delhi | Ranjam, Kirti |
| | IN6 | Saha Institute of Nuclear Physics | Sarkar, Subir |
| | IN7 | National Institute of Science Education and Research | Swain, Sanjay Kumar |
| | IN8 | Indian Institute of Science (IISc) | Komaragiri, Jyothsna Rani |
| | IN9 | Tata Institute of Fundamental Research-B | Mazumdar, Kajari |
| | IN10 | Indian Institute of Technology Madras | Behera, Prafulla Kumar |
| | IN11 | Indian Institute of Science Education and Research (IISER) | Sharma, Seema |

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|-------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Iran | IR1 | Institute for Research in Fundamental Science (IPM), School of Particles and Accelerators | Najafabadi, Mojtaba |
| Ireland | IE1 | University College Dublin | Grunewald, Martin |
| Italy | IT01 | INFN Sezione di Bari (a); Università di Bari (b); Politecnico di Bari (c) | My, Salvatore |
| | IT02 | INFN Sezione di Bologna (a); Università di Bologna (b) | Fabbri, Fabrizio |
| | IT03 | INFN Sezione di Catania (a); Università di Catania (b) | Tricomi, Alessia |
| | IT04 | INFN Sezione di Firenze (a); Università di Firenze (b) | Paoletti, Simone |
| | IT05 | INFN Sezione di Genova (a); Università di Genova (b) | Robutti, Enrico |
| | IT06 | INFN Sezione di Padova (a); Università di Padova (b); Università di Trento (Trento) (c) | Simonetto, Franco |
| | IT07 | INFN Sezione di Pavia (a); Università di Pavia (b) | Salvini, Paola |
| | IT08 | INFN Sezione di Perugia (a); Università di Perugia (b) | Fanò, Livio |
| | IT09 | INFN Sezione di Pisa (a); Università di Pisa (b); Scuola Normale Superiore di Pisa (c) | Bagliesi, Giuseppe |
| | IT10 | INFN Sezione di Roma (a); Università di Roma (b) | Del Re, Daniele |
| | IT11 | INFN Sezione di Torino (a); Università di Torino (b); Università del Piemonte Orientale (Novara) (c) | Solano, Ada |
| | IT12 | INFN Sezione di Milano-Bicocca (a); Università di Milano-Bicocca (b) | Tabarelli de Fatis, Tommaso |
| | IT13 | INFN Sezione di Napoli (a); Università di Napoli "Federico II" (b); Università della Basilicata (Potenza) (c); Università G. Marconi (Roma) (d) | Lista, Luca |
| | IT14 | INFN Sezione di Trieste (a); Università di Trieste (b) | Della Ricca, Giuseppe |
| | IT15 | INFN Laboratori Nazionali di Frascati | Benussi, Luigi |
| Korea | KR01 | Chonnam National University, Institute for Universe and Elementary Particles | Moon, Dong Ho |
| | KR06 | Korea University | Choi, Suyong |
| | KR11 | Kyungpook National University | Kim, Dong Hee |
| | KR12 | Seoul National University | Yang, Unki |
| | KR13 | Sungkyunkwan University | Choi, Young-Il |
| | KR15 | University of Seoul | Park, Inkyu |
| | KR16 | Hanyang University | Kim, Tae Jeong |
| | KR17 | Sejong University | Kim, Hyunsoo |
| Latvia | LV01 | Riga Technical University (RTU) and University of Latvia (LU) | Torims, Toms |
| Lithuania | LT01 | Vilnius University | Bernotas, Andrius |
| | LT02 | Lithuanian Academy of Sciences | |
| Malaysia | MA1 | University of Malaya | Wan Abdullah, Wan Ahmad Tajuddin |
| Mexico | MX1 | Centro de Investigacion y de Estudios Avanzados del IPN | Castilla Valdez, Heriberto |
| | MX2 | Universidad Iberoamericana | Carrillo, Salvador |
| | MX3 | Benemerita Universidad Autonoma de Puebla | Salazar Ibarquen, Humberto |
| | MX4 | Universidad Autonoma de San Luis Potosi | Morelos Pineda, Antonio |
| Montenegro | MO1 | University of Montenegro | Raičević, Nataša |
| New Zealand | NZ1 | University of Auckland | Krofcheck, David |
| | NZ2 | University of Canterbury | Butler, Philip |
| Pakistan | PK1 | National Centre for Physics, Quaid-I-Azam University | Ahmad Ashfaq; Hoorani, Hafeez R. |
| Poland | PL1 | Institute of Experimental Physics, Faculty of Physics, University of Warsaw | Królikowski, Jan |
| | PL3 | National Centre for Nuclear Research | Górski, Maciej |
| | PL4 | AGH University of Science and Technology, Faculty of Computer Science, Electronic and Telecommunications, department of Computer Science | Malawski, Maciej, Grzanka, Leszek |
| Portugal | PT1 | Laboratorio de Instrumentacao e Fisica Experimental de Particulas | Varela, Joao |
| Russia | JINR | Joint Institute for Nuclear Research | Golutvin, Igor |
| | RU1 | State Research Center of Russian Federation, Institute for High Energy Physics | Tyurin, Nikolay |
| | RU2 | Institute for Nuclear Research | Matveev, Victor |
| | RU3 | Institute for Theoretical and Experimental Physics | Gavrilov, Vladimir |
| | RU4 | Skobel'syn Institute of Nuclear Physics, Lomonosov Moscow State University | Boos, Edouard |
| | RU5 | P.N. Lebedev Physical Institute | Dremin, Igor |
| | RU6 | Petersburg Nuclear Physics Institute | Vorobyev, Alexey |
| | RU7 | National Research Nuclear University 'Moscow Engineering Physics Institute' (MEPhI) | Daniilov, Mikhail |
| | RU8 | Moscow Institute of Physics and Technology | Aushev, Tagir |
| | RU9 | Novosibirsk State University (NSU) | Skovpen, Yuri |
| | RU10 | National Research Tomsk Polytechnic University | Baidali, Sergei |
| | RU11 | Tomsk State University (TSU) | Ivantchenko, Vladimir/ Tcherniaev, Evgueni |
| Serbia | SE1 | University of Belgrade, Faculty of Physics and Vinca Institute of Nuclear Sciences | Adzic, Petar |
| Spain | SP1 | Centro de Investigaciones Energéticas Medioambientales y Tecnológicas (CIEMAT) | Alcaraz Maestre, Juan |
| | SP2 | Universidad Autónoma de Madrid | Fernández De Troconiz Acha, Jorge |
| | SP3 | Universidad de Oviedo | Cuevas Maestro, Javier |
| | SP4 | Instituto de Física de Cantabria (IFCA), CSIC-Universidad de Cantabria | Martínez Rivero, Celso |

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|----------------|------|---------------------------------------------------------------------------------|---------------------------------|
| Sri Lanka | LK01 | University of Ruhuna | Welathantri, Dharmaratna |
| | LK02 | University of Colombo | Sonnadara, Upul J. |
| Switzerland | SW1 | Institute for Particle Physics, ETH Zurich | Dissertori, Gunther |
| | SW2 | Paul Scherrer Institut | Kotlinski, Danek |
| | SW3 | Universität Zurich | Canelli, Florencia |
| Taipei | TA1 | National Central University (NCU) | Kuo, Chia-Ming |
| | TA2 | National Taiwan University (NTU) | Hou, George Wei-Shu |
| Thailand | TH1 | Chulalongkorn University | Asavapibhop, Burin |
| Turkey | TR1 | Cukurova University | Dumanoglu, Isa |
| | TR2 | Middle East Technical University, Physics Department | Zeyrek, Mehmet |
| | TR3 | Bogazici University, Department of Physics | Gülmez, Erhan |
| | TR4 | Istanbul Technical University | Cankocak, Kerem |
| Ukraine | UR2 | National Scientific Center, Kharkov Institute of Physics and Technology | Levchuk, Leonid |
| | UR3 | Kharkov State University | |
| | UR4 | Institute for Scintillation Materials of National Academy of Science of Ukraine | Grynyov, Boris |
| United Kingdom | UK1 | Brunel University | Hobson, Peter |
| | UK2 | Imperial College, University of London | Davies, Gavin |
| | UK3 | Rutherford Appleton Laboratory | Shepherd-Themistocleous, Claire |
| | UK4 | University of Bristol | Goldstein, Joel |
| USA | US02 | Boston University | Rohlf, James |
| | US03 | University of California, Davis | Conway, John |
| | US04 | University of California, Los Angeles | Cousins, Robert |
| | US05 | University of California, Riverside | Hanson, Gail |
| | US06 | University of California, San Diego | Branson, James G. |
| | US07 | California Institute of Technology | Newman, Harvey B. |
| | US08 | Carnegie Mellon University | Paulini, Manfred |
| | US09 | Fairfield University | Winn, Dave |
| | US10 | Fermi National Accelerator Laboratory | Burkett, Kevin |
| | US11 | University of Florida | Mitselmakher, Guenakh |
| | US12 | Florida State University | Prosper, Harrison |
| | US14 | University of Illinois at Chicago (UIC) | Gerber, Cecilia Elena |
| | US16 | The University of Iowa | Onel, Yasar |
| | US17 | Johns Hopkins University | Swartz, Morris |
| | US18 | Lawrence Livermore National Laboratory | Wright, Douglas |
| | US20 | University of Maryland | Skuja, Andris |
| | US21 | Massachusetts Institute of Technology | Paus, Christoph |
| | US22 | University of Minnesota | Rusack, Roger |
| | US23 | University of Mississippi | Cremaldi, Lucien Marcus |
| | US24 | University of Nebraska-Lincoln | Snow, Gregory R. |
| | US25 | Northeastern University | Barberis, Emanuela |
| | US26 | Northwestern University | Velasco, Mayda |
| | US27 | University of Notre Dame | Jessop, Colin |
| | US28 | The Ohio State University | Durkin, Lloyd Stanley |
| | US29 | Princeton University | Olsen, James |
| | US30 | Purdue University | Neumeister, Norbert |
| | US31 | Rice University | Padley, Brian Paul |
| | US32 | University of Rochester | Demina, Regina |
| | US33 | Rutgers, The State University of New Jersey | Gershtein, Yuri |
| | US35 | Texas Tech University | Akchurin, Nural |
| | US37 | University of Wisconsin - Madison | Smith, Wesley H. |
| | US38 | Kansas State University | Maravin, Yurii |
| | US39 | The University of Kansas | Bean, Alice |
| | US40 | University of California, Santa Barbara | Incandela, Joe |
| | US41 | Florida Institute of Technology | Hohlmann, Marcus |
| | US42 | Florida International University | Markowitz, Pete |
| | US45 | Cornell University | Alexander, James |
| | US46 | Brown University | Narain, Meenakshi |
| | US47 | Vanderbilt University | Johns, Willard |
| | US48 | University of Colorado at Boulder | Cumalat, John Perry |
| | US49 | University of Puerto Rico | Malik, Sudhir |
| | US50 | Purdue University Northwest | Parashar, Neeti |
| | US51 | The Rockefeller University | Mesropian, Christina |
| | US52 | State University of New York at Buffalo | Kharchilava, Avto |
| | US53 | Texas A&M University | Safonov, Alexei |
| | US54 | University of Virginia | Cox, Bradley |
| | US55 | Wayne State University | Karchin, Paul Edmund |
| | US56 | University of Tennessee | Spanier, Stefan |
| | US58 | The University of Alabama | Henderson, Conor |
| | US59 | Baylor University | Hatakeyama, Kenichi |
| | US60 | The Catholic University of America | Dominguez, Aaron |
| Uzbekistan | UZ1 | Institute of Nuclear Physics of the Uzbekistan Academy of Sciences | Yuldashev, Bekhzad S. |

Annex 2: CMS Funding Agencies and their Representatives.

| | | |
|-------------------|-----------------------------------------------------------------------------------------------------|---------------------|
| Austria | Austrian Federal Ministry of Education, Science and Research | D. Weselka |
| Belgium | Fonds voor Wetenschappelijk Onderzoek (FWO) | H. Willems |
| | Fonds de la Recherche Scientifique (F.R.S.-FNRS) | V. Halloin |
| Brazil | Rede Nacional de Física de Altas Energias (RENAFAE) | I. Bediaga |
| | Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) | C. H. de Brito Cruz |
| Bulgaria | Ministry of Education and Science | K. Valchev |
| CERN | European Organization for Nuclear Research | E. Elsen |
| China | National Natural Science Foundation (NSFC) | Y. Zhang |
| Colombia | Colciencias | P. Patino |
| Croatia | Ministry of Science, Education and Sports | B. Divjak |
| Cyprus | Ministry of Education and Culture | V. Tsakalos |
| Ecuador | Secretaría de Educación Superior, Ciencia, Tecnología e Innovación (SENESCYT) | X. M. Ponce León |
| Egypt | Academy of Scientific Research and Technology -Egyptian Network of High Energy Physics (ASRT-ENHEP) | M. M. Sakr |
| Estonia | National Institute of Chemical Physics and Biophysics (NICPB) | M. Kadastik |
| Finland | Helsinki Institute of Physics (HIP) | K. Huitu |
| France-CEA | Commissariat à l'Energie Atomique (CEA) Saclay | A.I. Etiennevre |
| France-IN2P3 | Institut National de Physique Nucléaire et de Physique des Particules (CNRS- IN2P3) | R. Pain, P. Verdier |
| Germany-BMBF | Bundesministerium für Bildung und Forschung | V. Dietz |
| Germany-Helmholtz | Helmholtz Association | M. Fleischer |
| Greece | General Secretariat for Research and Technology | P. Kyprianidou |
| Hungary | National Office for Research and Technology, (NKTH) | J. Pálinkás |
| India | Department of Atomic Energy (DAE) | S. Basu |
| | Department of Science & Technology (DST) | A. Sharma |
| Iran | School of Particles and Accelerators, Institute for Research in Fundamental Science (IPM) | M. Alishahiha |
| Ireland | University College Dublin (UCD) | M. Grünewald |
| Italy | Istituto Nazionale di Fisica Nucleare (INFN) | F. Ferroni |

| | | |
|----------------|--------------------------------------------------------------------------------------------------|--------------------|
| Korea | Ministry of Science, ICT and future Planning (MSIT) | S.H. Soon |
| | National Research Foundation (NRF) | Y.D. Ryu |
| Latvia | Ministry of Education and Science of the Republic of Latvia | K. Šadurskis |
| Lithuania | Ministry of Education and Science | J. Petrauskienė |
| Malaysia | University of Malaya | A.R. Hashim |
| Mexico | CONACYT | J. Tagüeña Parga |
| Montenegro | Ministry of Science | S. Damjanović |
| New Zealand | University of Canterbury | I. Wright |
| | University of Auckland | J. Harding |
| Pakistan | Pakistan Atomic Energy Commission | M. Naeem |
| Poland | Ministry of Science and Higher Education | D. Drewniak |
| Portugal | Fundação para a Ciência e a Tecnologia | P. Ferrão |
| RDMS-DMS | Joint Institute for Nuclear Research (JINR) | V. Matveev |
| RDMS-Russia | Ministry of Education and Science of Russian Federation | O. Vasilyeva |
| Serbia | Ministry of Education, Science and Technological Development | V. Popovic |
| Spain | Secretaría de Estado de Investigación, Desarrollo e Innovación, Programa de Física de Partículas | M. Martínez Pérez |
| Sri Lanka | Ministry of Science, Technology and Research | S. Wijayabandara |
| Switzerland | Rat der Eidgenössischen Technischen Hochschulen | K. Baltensperger |
| | ETH Zürich | D. Günther |
| | University of Zürich | M. Schaeppman |
| | Paul Scherrer Institut (PSI) | K. Kirch |
| Taipei | Ministry of Science and Technology | G.W.S. Hou |
| Thailand | Chulalongkorn University (CU) | B. Eua-arporn |
| Turkey | Turkish Atomic Energy Authority (TAEK) | Z. Demircan |
| United Kingdom | Science and Technology Facilities Council (STFC) | A. Medland |
| USA-DOE | US Department of Energy (DOE) | A. Patwa, S. Rolli |
| USA-NSF | National Science Foundation (NSF) | M. W. Coles |

Annex 3: General Conditions for Experiments Performed at CERN.

ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE

CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

GENERAL CONDITIONS

APPLICABLE TO

EXPERIMENTS PERFORMED AT CERN

20 February 2008

General Conditions applicable to Experiments at CERN

20 February 2008

GENERAL CONDITIONS

applicable to

Experiments at CERN

(Terms with a particular meaning in the context of this document are defined at the end – their first occurrence in the document is indicated with a reference number thus: termⁿ).

The mission of the European Organization for Nuclear Research (“*CERN*”) is to sponsor international scientific research in high-energy physics.

This document (the “*General Conditions*”) sets out the rules and procedures in organisational, managerial and financial matters, which apply to the participation by Universities and Research Institutions (the “*Collaborating Institution(s)*”) in experiments at CERN. The Collaborating Institutions jointly constitute the “*Collaboration*”. They provide, and are responsible for, the Visiting Research Teams¹ (the “*Team(s)*”) carrying out the experiment.

The General Conditions also define CERN's role as Host Laboratory of the experiment, which must be distinguished from its role as a Collaborating Institution, as the case may be.

Any reference made in the General Conditions to a specific document shall be to its most recent version.

1. SCOPE OF APPLICATION

The General Conditions apply to Approved Experiments² (the “*Experiment(s)*”) carried out on the CERN site³. They do not apply to Recognised Experiments⁴.

2. PARTIES AND THEIR REPRESENTATION

2.1. The parties involved in the Experiment (the “*Party*” or the “*Parties*”) are:

- CERN as Host Laboratory;
- The Collaborating Institutions (including, as the case may be, CERN).

2.2. Each Party shall have a representative:

- CERN as Host Laboratory shall be represented by its Director of Research, acting on behalf of the Director-General;
- The Collaboration shall appoint a Spokesperson, who shall represent the Collaboration to the outside, including to CERN as Host Laboratory, and co-ordinate its work. Where the Spokesperson is not stationed full-time at CERN, the Collaboration shall also appoint a Contactperson at CERN;
- Each Collaborating Institution shall appoint a Team Leader who shall represent it in its relations with CERN as Host Laboratory. The Team Leader's responsibilities are detailed in the “Appointment of Team Leader” form (available on the Users' Office Web site – see Article 5.7).

Page 1

General Conditions applicable to Experiments at CERN

20 February 2008

- 2.3. Each Collaborating Institution shall ensure that the members of its Team (the "Team Member(s)") comply with the General Conditions.

3. BASIC DOCUMENTS GOVERNING THE EXECUTION OF THE EXPERIMENT

- 3.1. The following documents shall constitute the formal basis for the Experiment:

3.1.1. the *EXPERIMENTAL PROPOSAL*, after its approval by the CERN Research Board on the recommendation of the Experiment Committee dealing with the appropriate part of the physics programme (the "Experiment Committee");

3.1.2. the *TECHNICAL DESIGN REPORTS*, where appropriate;

3.1.3. the *MEMORANDUM OF UNDERSTANDING* (the "MoU"), which sets out the detailed arrangements specific to the Experiment and which shall be agreed and signed by CERN as Host Laboratory and the Collaborating Institutions, for the purpose of signature represented, as the case may be, by their Funding Agencies³. Through the signature of the MoU, the Collaborating Institutions accept its terms;

3.1.4. the *GENERAL CONDITIONS*.

Contents of the MoU

- 3.2. The MoU may be a single document setting out the arrangements for construction, installation, maintenance and operation, or it may comprise two documents, one for construction and installation and the other for maintenance and operation. As a guide, the essential parts of the MoU are the following:
- a) a list of the Collaborating Institutions responsible for the Teams carrying out the Experiment;
 - b) a list of the Funding Agencies of the Collaboration;
 - c) details of the persons with specific responsibilities in the Experiment;
 - d) the obligations of the Parties for:
 - i) construction and installation
 - the obligations for construction and installation of the detector components and the auxiliary equipment (jointly the "Equipment");
 - a breakdown of the funding requirements for the Equipment, together with the contributions of the Parties;
 - a timetable for the construction and installation of the Equipment;
 - ii) maintenance and operation
 - the obligations for maintenance and operation of the Equipment;
 - e) an explicit statement that the General Conditions apply;
 - f) references to any specific agreements and Protocols relevant to the Experiment, copies of which shall be included as Appendices to the MoU.

General Conditions applicable to Experiments at CERN

20 February 2008

4. ORGANISATION OF THE COLLABORATION

Internal autonomy and co-ordination with CERN as Host Laboratory

- 4.1. In its internal relations, the Collaboration shall be free to take such organisational decisions as deemed necessary, always subject to the terms of the MoU and the General Conditions. Any financial arrangements between CERN as Host Laboratory and the Collaboration shall be subject to the Financial and Administrative Provisions for Visiting Research Teams.

Co-ordination in matters of safety

- 4.2. The Leader of the CERN Department responsible for the physics programme of which the Experiment is part shall appoint a Group Leader in Matters of Safety (GLIMOS), on the proposal of the Spokesperson. The rights and responsibilities of the GLIMOS are defined in the document "Safety Policy at CERN - SAPOCO/42".

Finance Review Committee/Resources Review Board

Initial Decision

- 4.3. For Experiments involving large capital investments, a Finance Review Committee (FRC) or a Resources Review Board (RRB) may be set up by agreement of CERN as Host Laboratory and the Collaboration.

Membership

- 4.4. The FRC/RRB shall consist of one representative of each Funding Agency, along with the Managements of CERN and the Collaboration. It shall be chaired by the CERN Director of Research.

Terms of reference

- 4.5. The role of the FRC/RRB includes:
- reaching agreement on the MoU;
 - approving any modification of, or addition to, the Experiment that would require amending the MoU;
 - monitoring the supply of Equipment according to the agreed schedule;
 - monitoring the Common Projects⁶ and the use of the Common Funds⁷;
 - monitoring the general financial and manpower support;
 - approving a maintenance and operation procedure and monitoring its functioning;
 - approving the annual construction and installation budgets as well as those for maintenance and operation.
- 4.6. The Collaboration Management reports to the FRC/RRB on technical, managerial, financial and administrative matters, and on the composition of the Collaboration.

General Conditions applicable to Experiments at CERN

20 February 2008

5. CERN'S OBLIGATIONS AS HOST LABORATORY**PRINCIPLES****Installation**

- 5.1. The Collaboration shall ensure that the Equipment and counting rooms meet the CERN Safety Rules. Provided that this is the case, CERN shall agree in writing to their installation in the appropriate experimental area.

Duration

- 5.2. CERN shall agree to keep the Equipment on-site during the data-taking for the experimental programme approved by the CERN Research Board.

Network connections

- 5.3. CERN shall agree that computers and peripherals belonging to the Collaboration, which are needed for the operation of the Equipment, may be connected to the CERN computer network, provided they meet its compatibility and security standards, including as set out in the document "Operational Circular No 5 – Use of CERN Computing Facilities" and subsidiary rules.

Insurance**- Property**

- 5.4. CERN shall at its expense insure against the risks of fire, explosion, natural disaster and water damage all items belonging to the Collaboration or a Collaborating Institution, once they have been delivered to the CERN site, added to the Ownership Inventory (Article 6.10) and accepted in writing by CERN. CERN shall not insure such items against the risks of transport, crane or rigging accidents. It may however offer the possibility that such insurance is taken out at the expense of the Collaborating Institution(s) concerned.

- Third party liability

- 5.5. CERN shall at its expense insure the members of the Collaborating Institutions against third party liability incurred by them at CERN in the execution of the Experiment.

- Limitation of coverage

- 5.6. The insurance covers defined in Articles 5.4 and 5.5 are subject to the provisions, including the specified deductibles, exclusions and limits, of CERN's insurance policies. Any risk or amount not covered by such policies shall be for the exclusive account of the Collaboration. CERN does not warrant or accept liability as to the sufficiency of its insurance policies in relation to the risks incurred by the Collaboration.

SERVICES**User support, Users' Office and ACCU**

- 5.7. CERN operates a Users' Office as a point of contact with the user community. Documentation for users is maintained on the Users' Office Web site, which can

be accessed through the CERN home page (<http://www.cern.ch>). CERN shall provide access to its services, as described in the "CERN Guide for Newcomers" (available from the Users' Office Web site). The Users' Office provides assistance on questions concerning access to the services provided by CERN.

The Advisory Committee of CERN Users (ACCU) promotes links between CERN Management and the User Community and advises CERN Users on the working conditions and the arrangements for technical support.

Standard services and facilities

- 5.8. CERN normally provides, free of charge and within the limits and constraints imposed by the available resources and schedules of accelerators, the following standard services and facilities for the duration of the Experiment:

Particle beams and equipment

- a) particle beams and related shielding, monitoring equipment and standard communication with the accelerator control rooms;
- b) beam time allocation and scheduling, in accordance with the recommendations of the Experiment Committee;
- c) test-beam time for testing prototypes and calibrating final detector components, subject to the applicable scheduling and allocation procedures;

Space

- d) floor space in the experimental area(s) for the Equipment;
- e) laboratory and hall space for construction, testing and assembly of the Equipment;
- f) temporary short-term storage space for spare parts, handling and assembly tools and Equipment that is awaiting installation or removal. CERN reserves the right to charge the cost of longer-term storage of the above items to the Collaborating Institution(s) concerned;
- g) office space, equipped with standard furniture and infrastructure facilities including network connections, telephones and electricity;

Supplies and installations at the Experiment

- h) assistance with the installation and removal of the Equipment, such as the provision of crane and rigging services, geometrical survey and alignment, as well as transport of the Equipment on and between the parts of the CERN site and inside the experimental areas;
- i) mechanical infrastructure, local infrastructure for the supply of mains electricity, raw cooling water, compressed air and standard connections to the CERN communication network;

Computing

- j) central computing resources for the Collaboration, in amounts to be decided in accordance with the applicable CERN allocation procedures;

General Conditions applicable to Experiments at CERN

20 February 2008

Transport of persons

- k) basic transportation for personnel between the main parts of the CERN site, including the experimental areas;

Safety services

- l) access to its safety services for advice, inspection and verification, and first aid or other emergency help;

Administrative services

- m) access to its administrative services to assist the Collaboration in financial matters, in accordance with the Financial Rules and the Financial and Administrative Provisions for Visiting Research Teams;

Purchasing services

- n) access to its purchasing services to assist the Collaboration in placing purchase orders and contracts for its account, in accordance with the CERN Financial Rules and the CERN Purchasing Procedures. In such cases there is immediate automatic transfer of ownership to the Collaborating Institution(s) for which the purchase is made. This(These) Institution(s) shall hold CERN free and harmless from liability arising from such assistance;

Maintenance and operation

- o) the resources needed to operate and maintain the standard infrastructure and other equipment supplied by CERN as Host Laboratory.

Special services

- 5.9. A variety of services other than those specified above may be provided to the Collaboration on request, subject to the availability of resources. Such services shall be charged according to the applicable conditions.

Special equipment

- 5.10. Any additional infrastructure equipment to be provided by CERN, as well as the obligations of CERN and the Collaborating Institutions with regard to the construction, installation, maintenance and operation of such equipment, shall be explicitly mentioned in the MoU.

6. OBLIGATIONS OF THE COLLABORATING INSTITUTIONS**Basic obligations**

- 6.1. In their capacity as members of the personnel of CERN⁸, the Team Members shall be subject to the authority of the Director-General of CERN and shall comply with the rules and regulations in force at CERN. Items brought onto the site by the Collaboration are subject to the rules and regulations in force at CERN.

General Conditions applicable to Experiments at CERN

20 February 2008

Status of personnel

- 6.2. Each Collaborating Institution shall ensure that its Team Members shall for the duration of their Contract of Association⁹ with CERN (the "*Contract of Association*") remain employed by, and receive a salary from, their Collaborating Institution. It is understood that where they are students, the Team Members shall remain enrolled at their Collaborating Institution, and where they have a sponsor, they shall remain under contract with, and continue to be financed by, their sponsor.
- 6.3. Each Collaborating Institution shall ensure the provision of adequate social and third party liability insurance cover to its Team Members and the members of their family accompanying them. The social insurance must include cover against the financial consequences of illness and accidents that is adequate in the Host States of CERN for the duration of the Contract of Association.
- 6.4. Each Collaborating Institution shall be liable to CERN for any cost or expense resulting from the situation where its Team Members have insufficient insurance cover.

Medical surveillance and certificates

- 6.5. Each Collaborating Institution shall remain responsible for the medical surveillance of its Team Members and, in the case of Team Members who are to work in conditions which are deemed to pose special risks (e.g. radiation controlled areas), shall supply to the CERN Medical Service a certificate of medical fitness, for the first time on registration of the Team Member at CERN and then every two years thereafter (a form for such certificates is available on the Users' Office Web site – Article 5.7).

Safety briefings and inspections

- 6.6. The Collaborating Institutions, in conjunction with the CERN Department responsible for the physics programme of which the Experiment is part, shall ensure the safety of the Team Members and the Equipment. The Collaborating Institutions shall participate in safety meetings and studies of the Experiment. They shall ensure compliance by the Team Members with the CERN Safety Rules.

Each Team Member has specific safety responsibilities and obligations, as defined in the document "Safety Policy at CERN - SAPOCO/42". The Team Members shall attend the CERN safety course(s) for newcomers, any compulsory CERN safety course, and all specific safety courses deemed necessary by the Collaboration.

The CERN safety personnel shall be entitled to carry out safety visits, checks and inspections as well as other safety measures set out in the document "Safety Policy at CERN - SAPOCO/42".

Supply of Equipment

- 6.7. The Collaborating Institutions shall make available on the CERN site, according to an agreed timetable and in working order, the Equipment that they have undertaken to supply and commission. The Spokesperson shall promptly inform the CERN Director of Research of any material failure to meet the agreed schedule. For experiments with an FRC/RRB, this body shall monitor such matters.

General Conditions applicable to Experiments at CERN

20 February 2008

Transport, installation and dismantling of Equipment

- 6.8. Each Collaborating Institution supplying Equipment shall be responsible for its delivery to and removal from the CERN site, always in compliance with applicable export laws and restrictions. All such Equipment shall be properly documented to indicate its ownership status (Article 6.10) handling requirements and any potential hazards that it may pose. The Collaborating Institutions shall be collectively responsible for the installation and dismantling of the Equipment.

Ownership of Equipment

- 6.9. Except as may be agreed in writing by the owner and CERN as Host Laboratory, the delivery of Equipment to the CERN site or its handling on the CERN site shall not affect its ownership. The owner and CERN as Host Laboratory may agree in writing to transfer to CERN the ownership of Equipment which is no longer required by the Collaboration.

Ownership inventory

- 6.10. As a condition of coverage by CERN's insurance policy, the Collaboration shall provide CERN with a list of the Equipment which it brings on the CERN site, specifying for each item the owning Collaborating Institution(s) or joint ownership by the Collaboration. It shall keep the list up-to-date and inform CERN promptly of any modifications.

Maintenance and operation of Equipment

- 6.11. The Collaborating Institutions shall be collectively responsible for the maintenance and operation of the Equipment, and for providing the resources necessary to carry out the experimental programme.

Assignment of Equipment

- 6.12. Any Collaborating Institution providing Equipment shall continue to make it available to the Collaboration until the Experiment has been declared completed (Article 8.2).

Early removal of Equipment

- 6.13. The Collaboration may request the removal from the CERN site under the responsibility of the owning Collaborating Institution(s) of any Equipment which in the opinion of the Collaboration is no longer required for the Experiment.

Release of space

- 6.14. Space allocated for construction and assembly shall be released when these activities have terminated. As Host Laboratory, CERN reserves the right to change the space allocation during the lifetime of the Experiment. As soon as the Experiment has been declared completed (Article 8.2), all space used by the Collaboration, including office and laboratory space, and the space used for testing and running the Experiment, shall be made available to CERN for reallocation.

Removal of Equipment

- 6.15. Equipment shall be removed from the CERN site under the responsibility of the owning Collaborating Institution(s) within six months following a request from

General Conditions applicable to Experiments at CERN

20 February 2008

the Leader of the CERN Department responsible for the physics programme of which the Experiment is part.

- 6.16. The dismantling and removal of the Equipment must respect the CERN Safety Rules and the laws of the countries through which the dismantled Equipment will transit during the removal, including the country of its final destination (e.g. transport, disposal, elimination of special or radioactive waste). Except as may be agreed in writing by the Collaboration and CERN, the associated costs shall be borne by the Collaboration.

7. INTELLECTUAL PROPERTY

Publication and use of data and knowledge

- 7.1. CERN is bound by its Convention to publish or otherwise make generally available the results of its experimental and theoretical work.
- 7.2. The Collaborating Institutions shall strive to publish any data and knowledge resulting from the experiment through Open Access¹⁰ journals. Where the copyright in an article shall be transferred to the publisher, each Collaborating Institution shall ensure that it has the necessary internal authorisations to approve such a transfer.
- 7.3. Subject to Articles 7.4 and 7.5, each Collaborating Institution and CERN as Host Laboratory shall be entitled to use any data and knowledge resulting from the Experiment for its own scientific non-military purposes.

Contribution of proprietary information

- 7.4. A Collaborating Institution contributing proprietary information to the Collaboration shall ensure that it has or has procured the rights to use, and to contribute to the Collaboration for use by the other Collaborating Institutions, such proprietary information for the execution of the Experiment. The term "use" shall include any integration, modification, enhancement and redistribution. Where the use of proprietary information is subject to restrictions, the contributing Collaborating Institution shall disclose them in writing when making its contribution available to the Collaboration. The obligations defined in this article shall apply whether or not the proprietary information is pre-existing or developed in the execution of the Experiment, and whether or not it was developed individually or jointly with one or more other institution(s).

Use of proprietary information

- 7.5. The contribution by a Collaborating Institution of any proprietary information, including information protected by trademark, patent or copyright, shall not create any right in respect of such information for the other Collaborating Institutions, other than a free, irrevocable and non-exclusive licence to use such information in the execution of the Experiment.

Publication and disclosure of proprietary information

- 7.6. Subject to the intellectual property rights of the Collaborating Institutions having contributed the proprietary information and taking into account any potential for commercial exploitation, the Collaborating Institutions shall strive to publish and make publicly available all proprietary information contributed to the

General Conditions applicable to Experiments at CERN

20 February 2008

Collaboration. In particular, they shall consider making any software available under Open Source licence conditions.

Limitation of liability

- 7.7. The Collaborating Institutions provide no warranties or representations of any kind to each other.

Each Collaborating Institution shall use the data and knowledge resulting from the Experiment and the proprietary information contributed to the Collaboration at its own risk.

The Collaborating Institutions shall have no liability to each other with respect to the subject matter of this Article 7.

8. FINAL PROVISIONS

Modification of the Experiment and amendment to the MoU

- 8.1. The Collaboration shall agree on any modification of or addition to the Experiment that would require amending the MoU and shall inform CERN as Host Laboratory of such changes. For experiments with an FRC/RRB, such changes shall also be approved by this body. Where the changes constitute a substantial change to the Experiment, they shall be submitted to the Experiment Committee for approval by the CERN Research Board and the Director-General. Any amendment to the MoU shall be signed by the representatives of the parties to the MoU.

Duration of applicability of the MoU

- 8.2. Unless another duration is specified in the MoU, the MoU shall remain in force until the CERN Director of Research, in agreement with the Spokesperson, has declared the Experiment completed, the Equipment has been dismantled and the arrangements for its disposal agreed in writing.
- 8.3. Notwithstanding the foregoing, the General Conditions shall remain in force.

Observance of the MoU and the General Conditions

- 8.4. The MoU is not legally binding but the parties to the MoU recognise that the success of the Collaboration depends upon their adherence to its provisions. Any default under its provisions shall be dealt with, in the first instance, by the Collaboration in consultation with the CERN Management and if necessary then by the FRC/RRB (where such a body exists).
- 8.5. Notwithstanding the foregoing, the provisions of the General Conditions are binding.

Liability

- 8.6. Except as specifically stipulated in the General Conditions, the Parties shall not be liable to each other for any loss or damage arising in connection with the Experiment.

General Conditions applicable to Experiments at CERN

20 February 2008

Arbitration

- 8.7. If a dispute within the Collaboration or between the Collaboration and CERN as Host Laboratory cannot be resolved amicably, it shall be referred by any party to the dispute for arbitration to the President of the CERN Council, whose decision shall be binding and final, without right of revision or appeal.

Relevant documents

- 8.8. The following documents apply to the execution of the MoU:
- the CERN Guide for Newcomers;
 - Financial and Administrative Provisions for Visiting Research Teams;
 - Use of CERN Computing Facilities - Operational Circular No 5 (<http://cern.ch/ComputingRules/>);
 - the Safety Guide for experiments at CERN (<http://cern.ch/SafetyGuide/>);
 - the Safety Policy at CERN - SAPOCO/42;
 - Purchasing Rules and Procedures for Experiments at CERN

General Conditions applicable to Experiments at CERN

20 February 2008

Definitions

- ¹ **Visiting Research Team:** A Collaborating Institution's personnel involved in the Experiment.
- ² **Approved Experiment:** An Experiment approved by the CERN Research Board and the Director-General after consideration of a written proposal submitted to the appropriate Experiment Committee, taking into account scientific interest, technical feasibility and the constraints imposed by available resources.
- ³ **CERN site:** All parts of CERN's fenced-in domain and all of its underground works.
- ⁴ **Recognised Experiment:** An experiment in fields allied to particle physics, such as astroparticle physics, the full definition of which was decided by the CERN Research Board (CERN/DG/RB 99-285). The conditions applicable to such experiments are decided by the CERN Research Board on a case-by-case basis.
- ⁵ **Funding Agency:** A body providing resources to one or more of the Collaborating Institutions for the purpose of participation in the Experiment. A Collaborating Institution may itself be a Funding Agency.
- ⁶ **Common Project:** A project that the Collaboration has decided to manage jointly under the authority of the Collaboration Management.
- ⁷ **Common Funds:** Funds contributed by the Funding Agencies to joint accounts administered by the Collaboration Management.
- ⁸ **Member of the personnel of CERN:** All Team Members who are not employed by CERN are required to sign a Registration Form, in which they apply to become an associated member of the personnel of CERN.
- ⁹ **Contract of Association:** The contract defined in Article RI 2.04 of the Staff Rules and Regulations of CERN.
- ¹⁰ **Open Access:** The free, irrevocable, worldwide right of access to, and use of, a work in any digital medium for lawful purposes, subject to proper attribution of authorship.

Annex 4: Sub-detector Structure of the CMS detector.

The CMS detector is structured into the following sub-detector units which are used throughout this document

| Sub-detector | Reference | Subsystem |
|-----------------------------|-----------|------------------------------------------------------|
| Magnet | 1.1. | Barrel Yoke and Vacuum Tank |
| | 1.2. | Endcap Yokes |
| | 1.3. | Coil |
| | 1.4. | Magnet Installation |
| Tracker | 2.1. | Pixel Detectors |
| | 2.2. | Silicon Detectors |
| | 2.3. | Electronics for Si Detectors |
| | 2.4. | Power Supplies for Si Detectors |
| | 2.5. | Mech. Struct. & Cooling for Si Detectors |
| | 2.6. | Monitoring for Si Detectors |
| | 2.7. | Data Acquisition for Si Detectors |
| | 2.8. | Installation of Si Detectors |
| ECAL | 3.1. | Barrel |
| | 3.2. | Endcaps |
| HCAL | 4.1. | Barrel |
| | 4.2. | Outer Barrel |
| | 4.3. | Endcap |
| | 4.4. | Outer Endcap |
| | 4.5. | Forward |
| Muon Detector | 5.1. | Barrel Drifttubes |
| | 5.2. | Forward ME 1/1 |
| | 5.3. | Endcap CSC |
| | 5.4. | Barrel RPC |
| | 5.5. | Forward RPC |
| | 5.6. | Alignment |
| Trigger-DAQ | 6.1. | Trigger |
| | 6.2. | Data Acquisition |
| | 6.3. | Detector Controls |
| Offline Computing | 7.1. | Offline Infrastructure |
| Infrastructure | 8.1. | Access and Survey |
| | 8.2. | General Installation |
| | 8.3. | Cooling and Ventilation |
| | 8.4. | Safety |
| | 8.5. | Fixed Cranes |
| | 8.6. | Shielding Systems |
| Commissioning & Integration | 9.1. | Additional facilities for Commissioning on surface |
| | 9.2. | Detector Installation, Opening and Access Facilities |
| | 9.3. | General Services |

Annex 5: Management Structure of the CMS Collaboration.

THE CMS CONSTITUTION

Version 6.1, Last Revised in September 2017

<https://cms-docdb.cern.ch/cgi-bin/DocDB/ShowDocument?docid=3035>

Annex 6: Overview of Technical Participation of Institutes in Detector Construction.

| Institutes Participation | | System Ref. and Name | Subsystem Ref. | Tracker | | | | | | | | ECAL | | HCAL | | | | | Muon Detector | | | | | | T-DAQ | | Common Projects |
|--------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------|----------------|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---------------|------|------|------|------|------|-------|---|-----------------|
| | | | | 2.1. | 2.2. | 2.3. | 2.4. | 2.5. | 2.6. | 2.7. | 2.8. | 3.1. | 3.2. | 4.1. | 4.2. | 4.3. | 4.5. | 5.1. | 5.2. | 5.3. | 5.4. | 5.5. | 5.6. | 6.1. | 6.2. | | |
| ARI | Yerevan Physics Institute | | | | | | | | | | | * | | | * | | | | | | | | | | | | |
| ATI | Institut für Hochenergiephysik der OeAW | * | * | | | | * | | | | | | | | | | | | | * | * | * | | | | | |
| BE1 | Université Catholique de Louvain | * | | | | | * | | | | | | | | | | | | | | | | | | | | |
| BE2 | Université de Mons | * | | | | | * | | | | | | | | | | | | | | | | | | | | |
| BE3 | Université Libre de Bruxelles | * | | | | | * | | | | | | | | | | | | | | | | | | | | |
| BE4 | Universiteit Antwerpen | * | | | | | * | | | | | | | | | | | | | | | | | | | | |
| BE5 | Vrije Universiteit Brussel | * | | | | | * | | | | | | | | | | | | | | | | | | | | |
| BG1 | Institute for Nuclear Research and Nuclear Energy | | | | | | | | | | | | | * | | * | * | | | | | | | | | | |
| BG2 | University of Sofia | | | | | | | | | | | | | * | | * | * | | | | | | | | | | |
| BR1 | Universidade do Estado do Rio de Janeiro | | | | | | | | | | | | | | | | | | | | | | | | * | | |
| BR3 | Centro Brasileiro de Pesquisas Fisicas | | | | | | | | | | | | | | | | | | | | | | | | * | | |
| BR4 | Instituto de Fisica Teorica, Universidade Estadual Paulista | | | | | | | | | | | | | | | | | | | | | | | | * | | |
| BY1 | Byelorussian State University | | | | | | | | | | | * | | * | | | | | | | | | | | | | |
| BY2 | Research Institute for Nuclear Problems | | | | | | | | | | * | * | | | | | | | | | | | | | | | |
| BY3 | National Centre for Particle and High Energy Physics | | | | | | | | | | * | | * | | * | | | | | | | | | | | | |
| BY4 | Research Institute of Applied Physical Problems | | | | | | | | | | * | | | | | | | | | | | | | | | | |
| CERN | CERN, European Organization for Nuclear Research | * | * | * | * | * | * | * | * | * | * | * | | | * | | * | | * | * | * | * | * | * | * | * | |
| CNI | Institute of High Energy Physics | | | | | | | | | * | * | | | | * | | * | | | | | | | | | | |
| CN2 | University for Science and Technology of China | | | | | | | | | * | * | | | | | | | | | | | | | | | | |
| CN3 | State Key Lab. of Nucl. Phys. and Tech., Peking University | | | | | | | | | | | | | | | | | | * | * | | | | | | | |
| CO1 | Universidad de Los Andes | | | | | | | | | | | | | | | | | * | * | | | | | | * | | |
| CR1 | Technical University of Split | | | | | | | | | * | * | | | | | | | | | | | | | | | | |
| CR2 | University of Split | | | | | | | | | * | * | | | | | | | | | | | | | | | | |
| CR3 | Institute Rudjer Boskovic | | | | | | | | | * | * | | | | | | | | | | | | | | | | |
| CY1 | University of Cyprus | | | | | | | | | * | * | | | | | | | | | | | | | | | | |
| DE2 | Institut für Experimentelle Kernphysik | * | * | | * | * | * | * | * | | | | | | | | | | | | | | | | | | |
| DE3 | RWTH Aachen University, I. Physikalisches Institut | * | * | | * | * | * | * | * | | | | | | | | | | | | | | | | | | |
| DE4 | RWTH Aachen University, III. Physikalisches Institut A | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| DE5 | RWTH Aachen University, III. Physikalisches Institut B | * | * | | | | | * | | | | | | | | | | | | | | | | | | | |
| DE6 | University of Hamburg | | | | | | * | | | | | | | | | | | | | | | | | | | | |
| DE7 | Deutsches Elektronen-Synchrotron | | | | | | | | | | | | | | | | | | | | | * | * | | | * | |
| EE1 | National Institute of Chemical Physics and Biophysics | | | | | | | | | | | | | | | | | | | | | | | | * | | |
| FI1 | Department of Physics, University of Helsinki | * | | | | * | | | | | | | | | | | | | | | | * | * | | | | |
| FI2 | Helsinki Institute of Physics | * | | | | * | | | | | | | | | | | | | | | | * | * | | | | |
| FI7 | Lappeenranta University of Technology | | | | | * | | | | | | | | | | | | | | | | * | * | | | | |
| FR1 | Laboratoire Leprince-Ringuet, Ecole Polytechnique, IN2P3-CNRS | | | | | | | | | * | * | | | | | | | | | | | | | | | | |
| FR2 | Laboratoire d'Annecy-le-Vieux de Physique des Particules, IN2P3-CNRS | | | | | | | | | * | * | | | | | | | | | | | | | | | | |
| FR3 | DSM/IRFU, CEA/Saclay | | | | | | | | | * | * | | | | | | | | | | | | | | * | | |
| FR4 | Institut Pluridisciplinaire Hubert Curien, Université de Strasbourg, Université de Haute Alsace Mulhouse, CNRS/IN2P3 | * | * | | | | | | | | | | | | | | | | | | | | | | | | |
| FR5 | Université de Lyon, Université Claude Bernard Lyon 1, CNRS-IN2P3, Institut de Physique Nucléaire de Lyon | * | * | | | | * | | * | | | | | | | | | | | | | | | | | | |
| GE1 | Institute of High Energy Physics and Informatization, Tbilisi State University | | | | | | | | | * | * | | * | | | | | | | | | | | | | | |
| GE2 | E. Andronikashvili Institute of Physics, Academy of Science | | | | | | | | | | | | * | | | | | | | | | | | | | | |
| GR1 | Institute of Nuclear Physics "Demokritos" | | | | | | | | | * | * | | | | | | | | | | | * | * | | | | |
| GR2 | University of Athens | | | | | | | | | | | | | | | | | | | | | * | * | | | | |

| Institutes Participation | | System Ref. | and Name | | Subsystem Ref. | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|----------------------------------------------------------------------------------------|-------------|----------|------|----------------|------|------|------|------|---------|------|---------|------|------|------------------|------|------|------|------|------|----------|------|-----------------|------|---|---|
| | | 2 | Tracker | | | | | | | 3. ECAL | | 4. HCAL | | | 5. Muon Detector | | | | | | 6. T-DAQ | | Common Projects | | | |
| Code | Institute Name | | 2.1. | 2.2. | 2.3. | 2.4. | 2.5. | 2.6. | 2.7. | 2.8. | 3.1. | 3.2. | 4.1. | 4.2. | 4.3. | 4.5. | 5.1. | 5.2. | 5.3. | 5.4. | 5.5. | 5.6. | 6.1. | 6.2. | | |
| GR3 | University of Io-nnina | | | | | | | | | | | | | | | | | | | | | | | | | |
| HU1 | KFKI Research Institute for Particle and Nuclear Physics | | | | | | | | | | | | | | | | | | | | | | | | | |
| HU2 | University of Debrecen | | | | | | | | | | | | | | | | | | | | | | | | | |
| HU3 | Institute of Nuclear Research ATOMKI | | | | | | | | | | | | | | | | | | | | | | | | | |
| IE1 | University College Dublin | * | | | | | | | | | | | | | | | | | | | | | | | | |
| IN1 | Bhabha Atomic Research Centre | | | | | | | | | | | * | | | | | | | | | | | | | | |
| IN2 | Panjab University | | | | | | | | | | | | | * | | | | | | | | | | | | |
| IN3 | Tata Institute of Fundamental Research - EHEP | | | | | | | | | | | | | * | | | | | | | | | | | | |
| IN4 | Tata Institute of Fundamental Research - HECR | | | | | | | | | | | | | * | | | | | | | | | | | | |
| IN5 | University of Delhi | | | | | | | | | | | * | | | | | | | | | | | | | | |
| IR1 | Institute for Studies in Theoretical Physics & Mathematics (IPM) | | | | | | | | | | | | | | | * | | | | | | | | | | * |
| IT01 | INFN Sezione di Bari (a); Universit# di Bari (b); Politecnico di Bari (c) | | * | * | * | | * | * | * | | | | | | | | | * | | | | | | * | | |
| IT02 | INFN Sezione di Bologna (a); Universita di Bologna (b) | | | | | | | | | | | | | | | | | * | | | | | | * | | |
| IT03 | INFN Sezione di Catania (a); Universita di Catania (b) | | * | * | * | | * | * | * | | | | | | | | | | | | | | | | | |
| IT04 | INFN Sezione di Firenze (a); Universita di Firenze (b) | | * | * | * | | * | * | * | | | | | | | | | | | | | | | | | |
| IT05 | INFN Sezione di Genova | | | | | | | | | | | | | | | | | | | | | | | | | * |
| IT06 | INFN Sezione di Padova (a); Universit# di Padova (b) | | * | * | * | | * | * | * | | | | | | | | | * | | | | | | * | | |
| IT07 | INFN Sezione di Pavia (a); Universita di Pavia (b) | | | | | | | | | | | | | | | | | * | | | | | | | | |
| IT08 | INFN Sezione di Perugia (a); Universita di Perugia (b) | | * | * | * | | * | * | * | | | | | | | | | | | | | | | | | |
| IT09 | INFN Sezione di Pisa (a); Universita di Pisa (b); Scuola Normale Superiore di Pisa (c) | | * | * | * | * | * | * | * | | | | | | | | | | | | | | | | | |
| IT10 | INFN Sezione di Roma (a); Universita di Roma "La Sapienza" (b) | | | | | | | | | | | * | | | | | | | | | | | | | | |
| IT11 | INFN Sezione di Torino (a); Universit# di Torino (b) | | * | * | * | | * | * | * | | | | | | | | | * | | | | | | * | | |
| IT12 | INFN Sezione di Milano-Bicocca (a); Universita di Milano-Bicocca (b) | | | | | | | | | | | * | * | | | | | | | | | | | | | |
| IT13 | INFN Sezione di Napoli (a); Universita di Napoli "Federico II" (b) | | | | | | | | | | | | | | | | | | * | | | | | | | |
| IT14 | INFN Sezione di Trieste (a); Universita di Trieste (b) | | | | | | | | | | | * | | | | | | | | | | | | | | * |
| IT15 | INFN Laboratori Nazionali di Frascati | | | | | | | | | | | | | | | | | | * | | | | | | | * |
| JINR | Joint Institute for Nuclear Research | | | | | | | | | | | * | | * | | | | * | | | | | | | | * |
| KR01 | Chonnam National University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR02 | Dongshin University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR03 | Seonam University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR04 | Wonkwang University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR05 | Konkuk University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR06 | Korea University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR07 | Cheju National University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR08 | Chungbuk National University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR09 | Kangwon National University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR10 | Seoul National University of Education | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR11 | Kyungpook National University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR12 | Seoul National University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| KR13 | Sungkyunkwan University | | | | | | | | | | | | | | | | | | * | | | | | * | | |
| MX1 | Centro de Investigacion y de Estudios Avanzados del IPN | * | | | | | | | | | | | | | | | | | | | | | | | | |
| MX2 | Universidad Iberoamericana | * | | | | | | | | | | | | | | | | | | | | | | | | |
| MX3 | Benemerita Universidad Autonoma de Puebla | * | | | | | | | | | | | | | | | | | | | | | | | | |
| MX4 | Universidad Autonoma de San Luis Potosi | * | | | | | | | | | | | | | | | | | | | | | | | | |
| NZ1 | University of Auckland | | | | | | | | | | | | | | | | | | | | | | | | | * |
| NZ2 | University of Canterbury | | | | | | | | | | | | | | | | | | | | | | | | | * |
| PK1 | National Centre for Physics, Quaid-I-Azam University | | | | | | | | | | | | | | | | | | * | | | | | | | |
| PL1 | Institute of Experimental Physics | | | | | | | | | | | | | | | | | | | | | | | | * | |
| PL2 | Soltan Institute for Nuclear Studies | | | | | | | | | | | | | | | | | | | | | | | * | | |
| PT1 | Laborat#rio de Instrumenta#o e F#sica Experimental de Part#culas | | | | | | | | | | | * | * | | | | | | | | | | | * | | |
| RU1 | State Research Center of Russian Federation, Institute for High Energy Physics | | | | | | | | | | | * | | * | | | | | | | | | | | | |
| RU2 | Institute for Nuclear Research | | | | | | | | | | | * | | * | | | | | | | | | | | | |
| RU3 | Institute for Theoretical and Experimental Physics | | | | | | | | | | | | | | * | | | | | | | | | | | |
| RU4 | Moscow State University | | | | | | | | | | | * | | * | | | | | | | | | | | | |
| RU5 | P.N. Lebedev Physical Institute | | | | | | | | | | | * | | * | | | | | | | | | | | | |
| RU6 | Petersburg Nuclear Physics Institute | | | | | | | | | | | * | | * | | | | | * | | | | | | | |

| Institutes Participation | | System Ref. and Name | Subsystem Ref. | 3. | | 4. | | | | 5. | | | | | | 6. | | Common Projects | | | | | | |
|--------------------------|--------------------------------------------------------------------------------|----------------------|----------------|---------|------|------|------|---------------|------|------|------|------|------|-------|------|------|------|-----------------|------|------|------|------|------|---|
| | | | | Tracker | ECAL | HCAL | | Muon Detector | | | | | | T-DAQ | | | | | | | | | | |
| Code | Institute Name | 2.1. | 2.2. | 2.3. | 2.4. | 2.5. | 2.6. | 2.7. | 2.8. | 3.1. | 3.2. | 4.1. | 4.2. | 4.3. | 4.5. | 5.1. | 5.2. | 5.3. | 5.4. | 5.5. | 5.6. | 6.1. | 6.2. | |
| SE1 | Vinca Institute of Nuclear Sciences | | | | | | | | | * | * | | | | | | | | | | | | | * |
| SP1 | Centro de Investigaciones Energeticas Medioambientales y Tecnologicas (CIEMAT) | | | | | | | | | | | | | | * | * | | | | | * | | | |
| SP2 | Universidad Aut6noma de Madrid | | | | | | | | | | | | | | * | | | | | | * | | | |
| SP3 | Universidad de Oviedo | | | | | | | | | | | | | | | | | | | | * | | | |
| SP4 | Instituto de Ffsica de Cantabria (IFCA), CSIC-Universidad de Cantabria | | | | | | | | | | | | | | | | | | | | * | | | |
| SW1 | Institute for Particle Physics, ETH Zurich | * | * | | | | | | | * | * | | | | | | | | | | | | | * |
| SW2 | Paul Scherrer Institut | * | | | | | | | | * | | | | | | | | | | | | | | * |
| SW4 | Universit6t Z, rich | * | | | | | | | | * | | | | | | | | | | | | | | * |
| TA1 | National Central University | | | | | | | | | | * | | | | | | | | | | | | | |
| TA2 | National Taiwan University (NTU) | | | | | | | | | * | | | | | | | | | | | | | | |
| TR1 | Cukurova University | | | | | | | | | | | | | | * | | | | | | | | | |
| TR2 | Middle East Technical University, Physics Department | | | | | | | | | | | | | | * | | | | | | | | | |
| TR3 | Boğaziçi University, Department of Physics | | | | | | | | | | | | | | * | | | | | | | | | |
| UK1 | Brunel University | | | * | | | | | | | * | | | | | | | | | | | | | |
| UK2 | Imperial College, University of London | | | * | | | | | | | * | | | | | | | | | | | | | |
| UK3 | Rutherford Appleton Laboratory | | | * | | | | | | | * | | | | | | | | | | | | | * |
| UK4 | University of Bristol | | | | | | | | | | * | | | | | | | | | | | | | * |
| UR1 | Institute of Single Crystals of National Academy of Science | | | | | | | | | | | | | * | | | | | | | | | | |
| UR2 | National Scientific Center, Kharkov Institute of Physics and Technology | | | | | | | | | | | | | * | | | | | | | | | | |
| UR3 | Kharkov State University | | | | | | | | | | | | | * | | | | | | | | | | |
| US02 | Boston University | | | | | | | | | | * | * | * | * | | | | | | | | | | |
| US03 | University of California, Davis | * | | | | | | | | | | | | | | * | | | | | | * | | |
| US04 | University of California, Los Angeles | | | | | | | | | | | | | | | * | | | | | | * | * | |
| US05 | University of California, Riverside | * | | | | | | | * | | | | | | | * | | | | | | | | |
| US06 | University of California, San Diego | | | | | | | | | | | | | | | * | | | | | | | | * |
| US07 | California Institute of Technology | | | | | | | | | * | | | | | | | | | | | | | | |
| US08 | Carnegie Mellon University | | | | | | | | | | | | | | | * | | | | | | * | | |
| US09 | Fairfield University | | | | | | | | | | | | | | * | | | | | | | | * | |
| US10 | Fermi National Accelerator Laboratory | * | | * | * | * | | | | | * | * | * | * | | * | | * | * | * | * | * | * | * |
| US11 | University of Florida | | | | | | | | | | | | | | | * | | | | | | * | | |
| US12 | Florida State University | | | | | | | | | | * | * | * | * | | | | | | | | | | |
| US14 | University of Illinois at Chicago (UIC) | | | | | | | | | | * | * | * | | | | | | | | | | | |
| US15 | The University of Iowa | | | | | | | | | | * | * | * | * | | | | | | | | | | |
| US17 | Johns Hopkins University | * | | | | | | | | | | | | | | | | | | | | | | * |
| US18 | Lawrence Livermore National Laboratory | | | | | | | | | | | | | | | | | | | | | | | * |
| US20 | University of Maryland | | | | | | | | | | * | * | * | | | | | | | | | | | * |
| US21 | Massachusetts Institute of Technology | | | | | | | | | | | | | | | | | | | | | * | * | |
| US22 | University of Minnesota | | | | | | | | | * | | * | * | * | | | | | | | | | | |
| US23 | University of Mississippi | * | | | | | | | | | * | * | * | | | | | | | | | | | |
| US24 | University of Nebraska-Lincoln | | | | | | | | | * | | | | | * | | | | | | | | | |
| US25 | Northeastern University | | | | | | | | | * | | | | | | | | | | * | | | | |
| US26 | Northwestern University | * | | | | | | | | | | | | | | | | | | | | | | |
| US27 | University of Notre Dame | | | | | | | | | | * | * | * | | | | | | | | | | | |
| US28 | The Ohio State University | | | | | | | | | | | | | | | * | * | | | | | * | | |
| US29 | Princeton University | | | | | | | | | * | | | | | | | | | | | | | | |
| US30 | Purdue University | * | | | | | | | | | * | * | * | * | | * | * | | | | | * | | |
| US31 | Rice University | | | | | | | | | | | | | | | * | | | | | | * | | |
| US32 | University of Rochester | | | | | | | | | | * | * | * | | | | | | | | | | | |
| US33 | Rutgers, the State University of New Jersey | * | | | | | | | | | | | | | | | | | | | | | | |
| US35 | Texas Tech University | * | | | | | | | | | | | | | * | | | | | | | | | |
| US37 | University of Wisconsin | | | | | | | | | | | | | | | * | | | | | | * | | |
| US38 | Kansas State University | | | * | | | | | | | | | | | | | | | | | | | | |
| US39 | The University of Kansas | | | * | | | | | | | | | | | | | | | | | | | | |
| US40 | University of California, Santa Barbara | | | * | | | | | | | | | | | | | | | | | | | | |
| US41 | Florida Institute of Technology | | | | | | | | | | | | | | * | | | | | | | | | |
| US42 | Florida International University | | | | | | | | | | | | | | | | | | | | | | | * |
| US45 | Cornell University | * | | | | | | | | * | | | | | | | | | | | | | | * |
| US46 | Brown University | | | | | | | | | | | | | | | | | | | | | * | | |
| US47 | Vanderbilt University | * | | | | | | | | | | | | | | | | | | | | * | | |
| US48 | University of Colorado at Boulder | * | | | | | | | | | | | | | | | | | | | | | | * |
| US49 | University of Puerto Rico | * | | | | | | | | | | | | | | | | | | | | | | * |
| US50 | Purdue University Calumet | * | | | | | | | | | * | | | | | | | | | | | | | * |
| US51 | The Rockefeller University | | | | | | | | | | * | | | | | | | | | | | | | * |
| US52 | State University of New York at Buffalo | * | | | | | | | | | | | | | | | | | | | | | | * |
| US53 | Texas A&M University | | | | | | | | | | * | | | | | * | | | | | | * | | |
| US54 | University of Virginia | | | | | | | | | * | | | | | | | | | | | | | | |
| UZ1 | Institute of Nuclear Physics of the Uzbekistan Academy of Sciences | | | | | | | | | | | | | * | | | | | | | | | | |

Annex 7: Common Items - Costs that the Collaboration has agreed are to bear at its common expense.

| Ref. | Sub-detector | Subsystem | RefItem |
|------|--------------|-----------------------------|----------------------------------------------------------|
| 1. | Magnet | Barrel Yoke and Vacuum Tank | 1.1. Barrel Yoke and Vacuum Tank |
| | | | 1.1.01 Barrel Rings and Vacuum Tank |
| | | | 1.1.02 High Tension Bolts |
| | | | 1.1.03 Hydraulic Tensioners |
| | | | 1.1.04 Support Feet - Outer - Material |
| | | | 1.1.04.A Support Feet - Outer - Material (Plates) |
| | | | 1.1.04.B Support Feet - Outer - Material (Welding) |
| | | | 1.1.05 Support Feet - Outer - Transport to Karachi |
| | | | 1.1.06 Support Feet - Outer - Manufacture |
| | | | 1.1.07 Support Feet - Outer - Transport to CERN |
| | | | 1.1.08 Manufacture Follow-up |
| | | | 1.1.08.A Manufacture Follow-up |
| | | | 1.1.08.B Photogrammetry and Survey |
| | | | 1.1.09 Moving Beams |
| | | | 1.1.10 Jacks and Air Pad System |
| | | | 1.1.11 Grease Pad Systems |
| | | | 1.1.12 Hydraulic Rotator |
| | | | 1.1.13 Drilling Machine |
| | | | 1.1.14 Rails |
| | | | 1.1.15 Assembly on Surface |
| | | | 1.1.16 Rigs and Scaffolds |
| | | | 1.1.17 Ancillaries and Coupling Devices |
| | | | 1.1.18 Design and Follow-up |
| | | Endcap Yokes | 1.2. Endcap Yokes |
| | | | 1.2.01 Endcap Disks |
| | | | 1.2.01.A KHI Contract (6 disks, 2 noses and ancillaries) |
| | | | 1.2.01.B FCI Contract (assembly of disks on surface) |
| | | | 1.2.02 Superbolts |
| | | | 1.2.03 HE Supports |
| | | | 1.2.04 Design and Follow-up |
| | | | 1.2.05 Carts Weldments |
| | | | 1.2.05.A Carts Weldments (In-kind from China) |
| | | | 1.2.05.B Carts Weldments (payment from Common Fund) |
| | | | 1.2.06 Transport of Carts to CERN |
| | | | 1.2.07 Ancillaries and Coupling Devices |
| | | | 1.2.08 Photogrammetry and Survey |
| | | | 1.2.09 Engineering, Supervision, Quality Control |
| | | | 1.2.10 Manufacture Follow-up |
| | | | 1.2.11 Support System |
| | | Coil | 1.3. Coil |
| | | | 1.3.01 Conductor - Insert |
| | | | 1.3.01.A Superconducting Strands |
| | | | 1.3.01.B Conductor - Insert |
| | | | 1.3.01.B Superconducting Strands - Spares |
| | | | 1.3.01.C Cabling Strands into Rutherford Cable |
| | | | 1.3.01.D Pure Aluminium (99.998 %) |
| | | | 1.3.01.E Co-extrusion of Insert |
| | | | 1.3.01.F Strands for Tests and Prototypes |
| | | | 1.3.02 Conductor - Reinforcement |
| | | | 1.3.02.A Alloy for Reinforcement |
| | | | 1.3.02.B EB Welding Reinforcement |
| | | | 1.3.03 Conductor - Quality Assurance |
| | | | 1.3.04 Module Assembly, Swiveling Tooling |
| | | | 1.3.05 Process Qualification and QA Winding |
| | | | 1.3.06 Thermal Shields |
| | | | 1.3.07 Cold Supports |
| | | | 1.3.08 He Circuits |
| | | | 1.3.09 Cold Mass Instrumentation |
| | | | 1.3.10 Vacuum System |
| | | | 1.3.11 Power Supply and Bus Bar |
| | | | 1.3.12 Dump Resistor |
| | | | 1.3.13 Magnet Safety System |
| | | | 1.3.14 Magnet Control System |
| | | | 1.3.15 He Refrigeration External Plant |
| | | | 1.3.16 Components Testing |
| | | | 1.3.17 Coil Assembly |
| | | | 1.3.18 Coil Surface Tests |
| | | | 1.3.19 Studies and Supervision |
| | | | 1.3.20 Consumables |
| | | | 1.3.21 Coil Transfer into Underground Cavern |
| | | | 1.3.22 Implantation and Integration |
| | | Magnet Installation | 1.4. Magnet Installation |

| Ref. | Sub-detector | Subsystem | Reftem |
|------|-----------------------------|------------------------------------------------------|----------------------------------------------------------------|
| | | | 1.4.01 2'200 t Crane Rental |
| | | | 1.4.02 Rigging Equipment |
| | | | 1.4.03 SX Infrastructure |
| | | | 1.4.04 Winch System |
| | | | 1.4.05 Field Mapping |
| 7. | Offline Computing | Offline Infrastructure | 7.1. Offline Infrastructure |
| | | | 7.1.1 File Servers |
| | | | 7.1.2 Information Servers |
| | | | 7.1.3 Computing Power |
| | | | 7.1.4 Spares |
| | | | 7.1.5 System Assembly |
| | | | 7.1.6 Software Licenses |
| | | | 7.1.7 System Management |
| 8. | Infrastructure | Access and Survey | 8.1. Access and Survey |
| | | | 8.1.1 Gangways, Stairs |
| | | | 8.1.2 Structures on Yoke |
| | | | 8.1.3 Personnel Access Equipment |
| | | | 8.1.4 General Survey |
| | | Cooling and Ventilation | 8.3. Cooling and Ventilation |
| | | | 8.3.1 Detector Cooling Plant |
| | | | 8.3.2 Detector Specific Ventilation |
| | | | 8.3.3 Detector Primary Cooling System |
| | | Fixed Cranes | 8.5. Fixed Cranes |
| | | | 8.5.1 80 ton / 100 m |
| | | | 8.5.2 80 ton / 100 m Double Beam System |
| | | | 8.5.3 20 ton Crane |
| | | | 8.5.4 3 ton Lift |
| | | General Installation | 8.2. General Installation |
| | | | 8.2.1 Counting Room Structures |
| | | | 8.2.2 Racks with Cooling |
| | | | 8.2.3 Electrical Distribution from Outlets |
| | | | 8.2.4 Gas Systems and Primary Distribution Racks |
| | | | 8.2.5 Beam Pipe |
| | | | 8.2.6 Cable Trays to Counting Rooms |
| | | | 8.2.7 Control Room and Cabling to Surface |
| | | | 8.2.8 General Piping |
| | | Safety | 8.4. Safety |
| | | | 8.4.1 Safety Installations |
| | | | 8.4.2 Safety Equipment Control |
| | | | 8.4.3 Hard-wired Safety System |
| | | | 8.4.4 Inertion System |
| | | Shielding Systems | 8.6. Shielding Systems |
| | | | 8.6.1 Rotating Shielding |
| | | | 8.6.2 Vertical 400 ton Lifting System |
| | | | 8.6.3 Mechanics and Shielding for Forward HCAL |
| 9. | Commissioning & Integration | Additional facilities for Commissioning on surface | 9.1. Additional facilities for Commissioning on surface |
| | | | 9.1.01 Mixed Water Cooling |
| | | | 9.1.02 Gas Distribution |
| | | | 9.1.03 Control Room |
| | | | 9.1.04 Smoke Detection |
| | | | 9.1.05 LV System (1 generator) |
| | | | 9.1.06 20t lifting equipment |
| | | | 9.1.07 Extra Electric & Optical Cabling |
| | | | 9.1.08 Common Electronics |
| | | | 9.1.09 Pre-cabling, pre-testing & related facilities |
| | | | 9.1.10 Basic DSS for Equipment Protection |
| | | | 9.1.11 Semi-clean areas |
| | | Detector Installation, Opening and Access Facilities | 9.2. Detector Installation, Opening and Access Facilities |
| | | | 9.2.01 Installation and access tooling |
| | | | 9.2.02 Dummy End Flanges (EB, EE, SE) |
| | | | 9.2.03 Magnet Closing System |
| | | | 9.2.04 Control for Magnet and Magnet Power Supply |
| | | | 9.2.05 Beampipe Vacuum Tooling & Support Structure |
| | | | 9.2.06 Floor Plates for UXC |
| | | | 9.2.07 Cherry Pickers & Access Platforms |
| | | General Services | 9.3. General Services |
| | | | 9.3.01 Workshops |
| | | | 9.3.02 Heavy Transport |
| | | | 9.3.03 Survey |
| | | | 9.3.04 Storage Infrastructure |
| | | | 9.3.05 Extra Engineering for Integration of Magnet & Detectors |
| | | | 9.3.06 Technical Support Team |

Annex 8: Deliverables (by Sub-detector/System) that are to be maintained and operated by individual Institutes or groups of Institutes.

8.1 The Magnet Sub-system is part of the common costs and listed in Annex 7

8.2 **Tracker**

8.2A **Deliverables to be provided by the Institutes for the individual Sub-detectors**
 See Annex 1 for the abbreviations of the names of Institutes

| Deliverables and Institutes | | | |
|------------------------------------------|--------|------------------------------------|----------------------------------------------------------------------------------------------------|
| Subsystem Name | Ref. | Deliverables | Institutes |
| Pixel Detectors | 2.1.01 | Detectors (incl. Pre-series) | IE1 NZ1 NZ2 SW1 SW2 SW4 US17 |
| | 2.1.02 | Electronics (include. Engineering) | AT1 IE1 NZ1 NZ2 SW1 SW2 SW4 US03 US10 US17 US23 US26 US33 US35 US45 US47 US48 US49 US50 US52 |
| | 2.1.03 | Module Mechanics | MX1 MX2 MX3 MX4 SW2 SW4 US10 US26 US35 |
| | 2.1.04 | Support Structures & Assembly | MX1 MX2 MX3 MX4 SW1 SW2 SW4 US03 US10 US26 US30 |
| | 2.1.05 | Monitoring | SW2 US03 US23 |
| | 2.1.06 | Service Systems | SW1 SW2 SW4 US23 |
| Silicon Detectors | 2.2.01 | Procurement of Sensors | AT1 BE1 BE2 BE3 BE4 BE5 CERN DE2 DE3 DE5 FI1 FI2 FR4 FR5 IT08 IT09 SW1 US38 US39 US40 |
| | 2.2.02 | Capton | CERN US38 US39 US40 |
| | 2.2.03 | Frames | BE1 BE2 BE3 BE4 BE5 US38 US39 US40 |
| | 2.2.04 | Pitch Adapters | BE1 BE2 BE3 BE4 BE5 US38 US39 US40 |
| | 2.2.05 | FE Hybrid | FR4 US38 US39 US40 |
| | 2.2.06 | Hybrid Support Plate | FR4 US38 US39 US40 |
| | 2.2.07 | Tooling and Box | BE1 BE2 BE3 BE4 BE5 FR5 IT01 IT03 IT08 US38 US39 US40 |
| | 2.2.08 | Interconnect Board | CERN DE3 IT01 US38 US39 US40 |
| | 2.2.09 | Module Preseries | AT1 BE1 BE2 BE3 BE4 BE5 CERN DE2 DE5 FR4 IT01 IT03 IT04 IT06 IT08 IT09 IT11 US05 US38 US39 US40 |
| Electronics for Si Detectors | 2.3.01 | Module Electronics | AT1 CERN IT06 UK1 UK2 UK3 |
| | 2.3.02 | Analogue Link | CERN DE2 DE3 DE5 FR4 FR5 IT01 IT03 IT04 IT06 IT08 IT09 IT11 US10 |
| | 2.3.03 | Digital Link | CERN US10 |
| | 2.3.04 | Analogue Optohybrid | DE3 DE5 IT08 |
| | 2.3.05 | Digital Optohybrid | CERN |
| | 2.3.06 | FED | CERN DE2 DE5 FR4 FR5 UK2 UK3 |
| | 2.3.07 | CCU Module | CERN |
| | 2.3.08 | FEC | AT1 CERN DE2 DE5 |
| Power Supplies for Si Detectors | 2.4.01 | Power Supplies | CERN IT04 IT11 |
| | 2.4.02 | Cables (installed) | CERN IT01 IT03 IT04 IT06 IT08 IT09 IT11 US10 |
| | 2.4.03 | Slow Control | CERN IT09 |
| Mech. Struct. & Cooling for Si Detectors | 2.5.01 | Inner Barrel | IT09 |
| | 2.5.02 | Inner Endcap | IT09 |
| | 2.5.03 | Outer Barrel | FI1 FI2 FI6 FI7 |
| | 2.5.04 | Outer Barrel Rods | FI1 FI2 FI6 FI7 |
| | 2.5.05 | Endcaps | DE2 DE3 |
| | 2.5.06 | Endcaps Petals | DE3 DE6 |
| | 2.5.07 | General Cooling | CERN US10 |
| | 2.5.08 | Integration (st, ts, etc.) | CERN |
| Monitoring for Si Detectors | 2.6.01 | Position Monitoring Systems | CERN DE3 IT01 IT03 US05 |
| | 2.6.02 | Temperature Control | CERN IT09 |
| Data Acquisition for Si Detectors | 2.7.01 | Test Stands | AT1 BE1 BE2 BE3 BE4 BE5 CERN DE2 DE3 DE5 FR5 IT01 IT03 IT04 IT06 IT08 IT09 IT11 |
| Installation of Si Detectors | 2.8.01 | Installation Manpower | CERN DE2 DE3 IT01 IT03 IT04 IT06 IT08 IT09 IT11 US05 |

8.2B Deliverables & Assigned Funding for the individual Sub-detectors by Funding Agency

Best Estimate of Assigned Funds as per Signed MoU and its Amendments

| Subsystem | Item | % Participation | | | | | | | | | | | Total Funding | |
|----------------------------------------------------------------|------------------------------------------------|-----------------|---------------|---------------|--------------|---------------|---------------|---------------|-----------------|--------------------------|----------------|-------------------|---------------|-------------------|
| | | Austria | Belgium | CERN | Finland | France-IN2P3 | Germany | Italy | Switzerland-PSI | Switzerland-Universities | United Kingdom | United States-DOE | | United States-NSF |
| | 2.1.01 Detectors (incl. Pre-series) | | | | | | | | 49.03% | 21.01% | | | 29.96% | 1,285 |
| 2.1. Pixel Detectors | 2.1.02 Electronics (include, Engineering) | 3.81% | | | | | | | 39.46% | 26.91% | | 16.26% | 13.57% | 4,460 |
| | 2.1.03 Module Mechanics | | | | | | | | 70.06% | | | 29.94% | | 1,570 |
| | 2.1.04 Support Structures & Assembly | | | | | | | | 10.53% | 59.65% | | 29.82% | | 285 |
| | 2.1.05 Monitoring | | | | | | | | 61.54% | | | 38.46% | | 130 |
| | 2.1.06 Service Systems | | | | | | | | | 70.59% | | 29.41% | | 510 |
| | 2.1. Pixel Detectors Total | | 2.06% | | | | | | | 43.69% | 24.27% | | 17.96% | 12.01% |
| 2.2. Silicon Detectors | 2.2.01 Procurement of Sensors | 4.67% | 3.90% | 22.59% | 2.57% | 14.92% | 15.94% | 35.13% | | | | 0.29% | | 20,783 |
| | 2.2.02 Capton | | | 28.07% | | | | 56.67% | 15.26% | | | | | 570 |
| | 2.2.03 Frames | | 90.84% | | | | | | 9.16% | | | | | 1,703 |
| | 2.2.04 Pitch Adapters | | 63.45% | 36.55% | | | | | | | | | | 1,223 |
| | 2.2.05 FE Hybrid | | 15.54% | | | 79.66% | 0.44% | | | | | 4.36% | | 2,291 |
| | 2.2.07 Tooling and Box | | 14.47% | | | 17.68% | | | 67.85% | | | | | 311 |
| | 2.2.08 Interconnect Board | | | 29.39% | | | 32.16% | 32.16% | | | | 6.29% | | 1,589 |
| | 2.2.09 Module Preseries | 4.77% | 28.98% | 3.91% | | 7.15% | 33.27% | 19.54% | | | | 2.38% | | 1,049 |
| 2.2. Silicon Detectors Total | | 3.46% | 11.80% | 20.89% | 1.81% | 17.12% | 15.79% | 28.17% | | | 0.97% | | 29,519 | |
| 2.3. Electronics for Si Detectors | 2.3.01 Module Electronics | | | 13.73% | 1.15% | | | 44.30% | | | 40.81% | | | 2,774 |
| | 2.3.02 Analogue Link | | | 23.49% | | 13.61% | 12.66% | 45.42% | | | 4.81% | | | 10,387 |
| | 2.3.03 Digital Link | | | 80.39% | | | 19.61% | | | | | | | 663 |
| | 2.3.04 Analogue Optohybrid | 67.30% | | | | | | 32.70% | | | | | | 847 |
| | 2.3.05 Digital Optohybrid | | | 100.00% | | | | | | | | | | 50 |
| | 2.3.06 FED | | 4.19% | 22.62% | 14.64% | 16.49% | 1.98% | 0.93% | | 8.99% | 19.20% | 10.97% | | 5,562 |
| 2.3. Electronics for Si Detectors Total | | 2.78% | 1.14% | 23.81% | 4.13% | 11.37% | 7.58% | 30.61% | | 2.44% | 13.17% | 2.98% | 20,503 | |
| 2.4. Power Supplies for Si Detectors | 2.4.01 Power Supplies | | | 10.54% | | | | 89.46% | | | | | | 5,742 |
| | 2.4.02 Cables (installed) | | | 31.44% | 5.85% | 0.25% | 0.93% | 51.53% | | | | 9.99% | | 3,553 |
| 2.4. Power Supplies for Si Detectors Total | | | | 18.53% | 2.24% | 0.10% | 0.36% | 74.97% | | | | 3.82% | 9,295 | |
| 2.5. Mech. Struct. & Cooling for Si Detectors | 2.5.01 Inner Barrel | | | | | | | 100.00% | | | | | | 1,033 |
| | 2.5.02 Inner Endcap | | | | | | | 100.00% | | | | | | 358 |
| | 2.5.03 Outer Barrel | | | 17.48% | 82.52% | | | | | | | | | 572 |
| | 2.5.04 Outer Barrel Rods | | | | 100.00% | | | | | | | | | 1,220 |
| | 2.5.05 Endcaps | | | | | 23.71% | 76.29% | | | | | | | 970 |
| | 2.5.06 Endcaps Petals | | 19.34% | | | | 80.66% | | | | | | | 905 |
| | 2.5.07 General Cooling | | | 81.82% | | | | 18.18% | | | | | | 2,200 |
| 2.5. Mech. Struct. & Cooling for Si Detectors Total | | 1.86% | 41.24% | 17.98% | 3.51% | 16.37% | 19.04% | | | | | | 9,408 | |
| 2.6. Monitoring for Si Detectors | 2.6.01 Position Monitoring Systems | | | 100.00% | | | | | | | | | | 540 |
| | 2.6.02 Temperature Control | | | 100.00% | | | | | | | | | | 350 |
| 2.6. Monitoring for Si Detectors Total | | | | 39.33% | | | 60.67% | | | | | | | 890 |
| 2.7. Data Acquisition for Si Detectors | 2.7.01 Test Stands | 3.30% | 6.60% | 6.60% | | 14.85% | 32.34% | 36.30% | | | | | | 1,515 |
| 2.7. Data Acquisition for Si Detectors Total | | 3.30% | 6.60% | 6.60% | | 14.85% | 32.34% | 36.30% | | | | | | 1,515 |
| 2.8. Installation of Si Detectors | 2.8.01 Installation Manpower | | | 60.00% | | | | 40.00% | | | | | | 1,000 |
| | 2.8. Installation of Si Detectors Total | | | 60.00% | | | | 40.00% | | | | | | 1,000 |
| Grand Total | | 2.25% | 4.96% | 22.02% | 4.08% | 9.89% | 10.97% | 30.24% | 4.48% | 3.11% | 3.36% | 3.40% | 1.23% | 80,370 |

8.3 Electromagnetic Calorimeter

8.3A Deliverables to be provided by the Institutes for the individual Sub-detectors

See Annex 1 for the abbreviations of the names of Institutes

| Deliverables and Institutes | | | |
|-----------------------------|-------|---------------------------|----------------------------------------------------------------------------------------|
| Subsystem Name | Ref. | Deliverables | Institutes |
| Barrel | 3.1.1 | Crystals | BY2 CERN CN1 CN2 CY1 FR2 IT10 SW1 |
| | 3.1.2 | Electronics | CERN CR1 CR2 CR3 CY1 FR1 FR2 FR3 FR5 IT10 IT14 PT1 SW1 SW2 US22 US25 US29 US45 US54 |
| | 3.1.3 | Mechanics | CERN FR1 FR5 IT10 IT12 SW1 |
| | 3.1.4 | Assembly and Installation | CERN FR3 SW1 |
| | 3.1.5 | Monitoring | FR3 SE1 US07 |
| Endcaps | 3.2.1 | Crystals | BY1 BY3 CERN CN1 CN2 RU1 RU2 RU4 SW1 UK1 UK2 UK3 UK4 |
| | 3.2.2 | Electronics | PT1 RU1 RU2 RU5 RU6 SW1 UK1 UK2 UK3 UK4 |
| | 3.2.3 | Mechanics | IT12 RU1 RU2 UK1 UK2 UK3 UK4 |
| | 3.2.4 | Assembly and Installation | RU1 RU2 UK1 UK2 UK3 UK4 |
| | 3.2.5 | Monitoring | FR3 RU1 SE1 |
| | 3.2.6 | Preshower | AR1 BY1 BY2 BY3 BY4 CERN GE1 GR1 GR3 IN1 IN5 JINR SE1 TA1 TA2 |

8.3B Deliverables & Assigned Funding for the individual Sub-detectors by Funding Agency

Best Estimate of Assigned Funds as per Signed MoU and its Amendments

| Subsystem | Item | % Participation | | | | | | | | | | | | | Total Funding | | | | | | |
|--------------|---------------------------------|-----------------|--------------|--------------|--------------|--------------|--------|---------------|---------------|--------------|----------|-------------|--------------|------------------|---------------|-----------------|---------------|----------------|-------------------|-------------------|---------------|
| | | CERN | Croatia | Cyprus | France-CEA | France-IN2P3 | Greece | India | Italy | Portugal | RDMS-DMS | RDMS-Russia | Serbia | Switzerland-ETHZ | | Switzerland-FSI | Taipei | United Kingdom | United States-DOE | United States-NSF | |
| 3.1. Barrel | 3.1.1 Crystals | 32.00% | | 0.01% | | 3.58% | | 1.02% | 2.29% | | | | | 61.10% | | | | | | | 48,913 |
| | 3.1.2 Electronics | 1.66% | 0.83% | 1.52% | 2.07% | 12.73% | | | 8.30% | 4.00% | | | 0.21% | 26.75% | 7.13% | | | 26.44% | 8.36% | 24,110 | |
| | 3.1.3 Mechanics | 15.38% | | | 1.24% | 33.12% | | | 20.30% | | | | | 29.96% | | | | | | | 9,754 |
| | 3.1.4 Assembly and Installation | 43.75% | | | | | | | | | | | | 56.25% | | | | | | | 4,800 |
| | 3.1.5 Monitoring | | | | 58.88% | | | | | | | | | | | | | | 41.12% | | 2,887 |
| | 3.1. Barrel Total | 21.72% | 0.22% | 0.41% | 2.57% | 8.90% | | 0.55% | 5.64% | 1.07% | | | 0.06% | 46.38% | 1.90% | | | | 8.36% | 2.23% | 90,464 |
| 3.2. Endcaps | 3.2.1 Crystals | 5.18% | | | | | | | | | | | 47.68% | 17.51% | | | 8.31% | 21.32% | | 16,417 | |
| | 3.2.2 Electronics | 1.45% | | 1.45% | 2.31% | 17.36% | | | | 5.06% | | | 0.29% | 26.76% | | | 13.74% | 31.59% | | 6,914 | |
| | 3.2.3 Mechanics | | | | | | | | | | | | 47.35% | | | | | 52.65% | | 4,361 | |
| | 3.2.4 Assembly and Installation | | | | | | | | | | | | 17.81% | 75.94% | | | | 6.25% | | 1,600 | |
| | 3.2.5 Monitoring | | | | 100.00% | | | | | | | | | | | | | | | | 640 |
| | 3.2. Endcaps Total | 29.23% | | | | | | 16.93% | 13.92% | | | | 1.39% | 10.44% | | | 26.09% | | | 7,184 | |
| | Grand Total | 17.79% | 0.16% | 0.37% | 2.45% | 7.25% | | 1.07% | 1.18% | 4.00% | | | 0.94% | 0.27% | 29.49% | | 16.00% | 5.05% | 12.69% | 15.31% | 37,116 |

8.4 **Hadron Calorimeter**

8.4A **Deliverables to be provided by the Institutes for the individual Sub-detectors**

See Annex 1 for the abbreviations of the names of Institutes

| Deliverables and Institutes | | | |
|-----------------------------|--------|---------------------------|--------------------------------------------------------------------------------------|
| Subsystem Name | Ref. | Deliverables | Institutes |
| Barrel | 4.1.01 | Mechanics | US10 US20 US23 US32 |
| | 4.1.02 | Optics | US10 US12 US14 US23 US27 US30 US32 |
| | 4.1.03 | Read-out Boxes | US10 US12 US14 US22 US23 US27 |
| | 4.1.04 | Photodetectors | US10 US22 US27 US30 US36 |
| | 4.1.05 | Front-end Electronics | US02 US10 US14 US22 US30 |
| | 4.1.06 | Calibration Systems | US10 US12 US15 US30 US32 |
| | 4.1.07 | Trigger/DAQ Electronics | US02 US10 US14 US20 |
| | 4.1.08 | Voltage Supply Systems | US10 US20 |
| | 4.1.09 | Detector Control Systems | US02 US10 US20 US27 US30 US50 US51 US53 |
| | 4.1.10 | Pre-production Prototypes | US10 US12 US14 US15 US20 US22 US23 US27 US30 US32 |
| Endcap | 4.3.01 | Mechanics | BG1 BG2 BY1 BY3 JINR PL3 UZ1 |
| | 4.3.02 | Optics | AR1 GE1 GE2 JINR PL3 RU1 RU2 UR1 UR2 UR3 US14 US23 US27 US30 US32 |
| | 4.3.03 | Read-out Boxes | US10 US14 US22 US23 US27 |
| | 4.3.04 | Photodetectors | US10 US22 US27 US30 US36 |
| | 4.3.05 | Front-end Electronics | US02 US10 US22 US30 |
| | 4.3.06 | Calibration Systems | RU1 US10 US12 US15 US30 |
| | 4.3.07 | Trigger/DAQ Electronics | US02 US10 US20 |
| | 4.3.08 | Voltage Supply Systems | US10 US20 |
| | 4.3.09 | Detector Control Systems | US02 US10 US20 US27 US30 |
| | 4.3.10 | Pre-production Prototypes | AR1 BG1 BG2 BY3 JINR RU1 RU2 UR2 UR3 US10 US12 US14 US15 US22 US23 US27 US30 US32 |
| Forward | 4.5.01 | Mechanics | HU1 HU3 IR1 RU3 RU4 US15 |
| | 4.5.02 | Optics | HU1 HU3 RU3 RU4 TR1 TR2 TR3 US15 |
| | 4.5.03 | Read-out Boxes | US09 US15 |
| | 4.5.04 | Photodetectors | US09 US15 |
| | 4.5.05 | Front-end Electronics | US02 US10 |
| | 4.5.06 | Calibration Systems | RU3 RU4 US09 US10 US12 US15 US16 US30 US41 |
| | 4.5.07 | Trigger/DAQ Electronics | US02 US10 US15 US16 |
| | 4.5.08 | Voltage Supply Systems | US09 US10 US41 |
| | 4.5.09 | Detector Control Systems | HU1 HU3 SP1 TR1 TR2 TR3 US02 US10 US16 |
| | 4.5.10 | Pre-production Prototypes | HU1 RU3 RU4 SP1 TR1 TR2 TR3 US02 US09 US10 US12 US15 US16 US30 US35 |
| | 4.5.11 | Luminosity Monitor | US24 |
| Outer Barrel | 4.2.01 | Mechanics | IN2 IN3 IN4 US10 |
| | 4.2.02 | Optics | IN2 IN3 IN4 US10 US14 US23 US27 US32 |
| | 4.2.03 | Read-out Boxes | US10 US14 US22 US23 US27 |
| | 4.2.04 | Photodetectors | US10 US22 US27 US36 |
| | 4.2.05 | Front-end Electronics | US02 US10 US22 |
| | 4.2.06 | Calibration Systems | US10 US12 US15 US30 |
| | 4.2.07 | Trigger/DAQ Electronics | US02 US10 US20 |
| | 4.2.08 | Voltage Supply Systems | US10 US20 |
| | 4.2.09 | Detector Control Systems | US02 US10 US20 US27 |
| | 4.2.10 | Pre-production Prototypes | IN2 IN3 IN4 US10 US12 US14 US15 US22 US23 US27 US32 |

8.4B Deliverables & Assigned Funding for the individual Sub-detectors by Funding Agency

Best Estimate of Assigned Funds as per Signed MoU and its Amendments

| Subsystem | Item | kCHF | | % Participation | | | | | | Total Funding |
|--------------------------------|----------------------------------|---------|--------|-----------------|----------|-------------|--------|-------------------|-------------------|---------------|
| | | Hungary | India | Iran | RDMS-DMS | RDMS-Russia | Turkey | United States-DOE | United States-NSF | |
| 4.1. Barrel | 4.1.01 Mechanics | | | | | | | 100.00% | | 12,328 |
| | 4.1.02 Optics | | | | | | | 90.84% | 9.16% | 2,590 |
| | 4.1.03 Read-out Boxes | | | | | | | 76.60% | 23.40% | 523 |
| | 4.1.04 Photodetectors | | | | | | | 25.24% | 74.76% | 1,892 |
| | 4.1.05 Front-end Electronics | | | | | | | 59.88% | 40.12% | 2,293 |
| | 4.1.06 Calibration Systems | | | | | | | 96.86% | 3.14% | 332 |
| | 4.1.07 Trigger/DAQ Electronics | | | | | | | 55.27% | 44.73% | 1,632 |
| | 4.1.08 Voltage Supply Systems | | | | | | | 61.37% | 38.63% | 317 |
| | 4.1.09 Detector Control Systems | | | | | | | 100.00% | | 437 |
| | 4.1.10 Pre-production Prototypes | | | | | | | 97.61% | 2.39% | 1,822 |
| 4.1. Barrel Total | | | | | | | | 85.10% | 14.90% | 24,167 |
| 4.2. Outer Barrel | 4.2.01 Mechanics | | | | | | | 100.00% | | 9 |
| | 4.2.02 Optics | | 97.97% | | | | | 1.43% | 0.60% | 2,289 |
| | 4.2.03 Read-out Boxes | | | | | | | 36.70% | 63.30% | 339 |
| | 4.2.04 Photodetectors | | 40.54% | | | | | 59.46% | | 241 |
| | 4.2.05 Front-end Electronics | | | | | | | 6.07% | 93.93% | 360 |
| | 4.2.06 Calibration Systems | | | | | | | 100.00% | | 40 |
| | 4.2.07 Trigger/DAQ Electronics | | | | | | | 55.51% | 44.49% | 533 |
| | 4.2.08 Voltage Supply Systems | | | | | | | 32.83% | 67.17% | 91 |
| | 4.2.09 Detector Control Systems | | | | | | | 100.00% | | 45 |
| | 4.2.10 Pre-production Prototypes | | 93.68% | | | | | 4.57% | 1.75% | 171 |
| 4.2. Outer Barrel Total | | | 60.73% | | | | | 18.19% | 21.07% | 4,116 |
| 4.3. Endcap | 4.3.01 Mechanics | | | | 56.32% | 29.37% | | 0.45% | 13.86% | 9,303 |
| | 4.3.02 Optics | | | | 11.19% | 46.54% | | 29.81% | 12.46% | 1,341 |
| | 4.3.03 Read-out Boxes | | | | | | | 73.24% | 26.76% | 308 |
| | 4.3.04 Photodetectors | | | | | | | 100.00% | | 67 |
| | 4.3.05 Front-end Electronics | | | | | | | 3.32% | 96.68% | 346 |
| | 4.3.06 Calibration Systems | | | | | | | 100.00% | | 234 |
| | 4.3.07 Trigger/DAQ Electronics | | | | | | | 23.40% | 76.60% | 587 |
| | 4.3.08 Voltage Supply Systems | | | | | | | 27.69% | 72.31% | 118 |
| | 4.3.09 Detector Control Systems | | | | | | | 100.00% | | 30 |
| | 4.3.10 Pre-production Prototypes | | | | 57.68% | 35.49% | | 6.41% | 0.42% | 563 |
| 4.3. Endcap Total | | | | | 44.32% | 27.57% | | 9.42% | 18.69% | 12,896 |
| 4.5. Forward | 4.5.01 Mechanics | | | 16.67% | | 60.65% | 22.12% | 0.56% | | 3,060 |
| | 4.5.02 Optics | | 19.64% | | | | | 80.36% | | 2,474 |
| | 4.5.03 Read-out Boxes | | | | | | | 100.00% | | 126 |
| | 4.5.04 Photodetectors | | | | | | | 100.00% | | 872 |
| | 4.5.05 Front-end Electronics | | | | | | | 36.56% | 63.44% | 452 |
| | 4.5.06 Calibration Systems | | | | | 14.38% | | 85.62% | | 410 |
| | 4.5.07 Trigger/DAQ Electronics | | | | | | | 31.61% | 68.39% | 315 |
| | 4.5.08 Voltage Supply Systems | | | | | | | 100.00% | | 109 |
| | 4.5.09 Detector Control Systems | | | | | | | 100.00% | | 57 |
| | 4.5.10 Pre-production Prototypes | 2.21% | | | | 36.00% | 2.04% | 59.75% | | 639 |
| 4.5. Forward Total | | 5.87% | | 5.99% | | 25.19% | 8.10% | 48.95% | 5.90% | 8,515 |
| Grand Total | | 1.01% | 5.03% | 1.03% | 11.50% | 11.47% | 1.39% | 53.72% | 14.85% | 49,694 |

8.5 Muon Detector

8.5A Deliverables to be provided by the Institutes for the individual Sub-detectors

See Annex 1 for the abbreviations of the names of Institutes

| Deliverables and Institutes | | | |
|-----------------------------|-------|-----------------------------------|-----------------------------------------------------------------------------|
| Subsystem Name | Ref. | Deliverables | Institutes |
| Barrel Drifttubes | 5.1.1 | Detectors and Components | CN1 DE4 IT02 IT06 IT11 SP1 SP2 |
| | 5.1.2 | Electronics | CERN CN1 DE4 IT02 IT06 IT11 SP1 SP2 |
| | 5.1.3 | Mechanical Structure and Supports | DE4 IT02 IT06 IT11 SP1 SP2 |
| | 5.1.4 | Assembly and Installation | DE4 IT02 IT06 IT11 SP1 SP2 |
| | 5.1.5 | Monitoring | DE4 IT02 IT06 IT11 |
| | 5.1.6 | Service Systems | CERN DE4 IT02 IT06 IT11 |
| Forward ME 1/1 | 5.2.1 | Detectors and Components | JINR |
| | 5.2.2 | Electronics | BG1 BG2 BY3 JINR US28 US30 |
| | 5.2.3 | Mechanical Structure, Supports | BY3 JINR |
| | 5.2.4 | Assembly and Installation | BY3 JINR |
| | 5.2.5 | Monitoring | BG1 BG2 JINR |
| | 5.2.6 | Service Systems | BY3 JINR |
| Endcap CSC | 5.3.1 | Detectors and Components | CN1 RU6 US03 US04 US05 US08 US10 US11 US37 |
| | 5.3.2 | Electronics | RU6 US03 US04 US08 US28 US30 US31 |
| | 5.3.3 | Mechanical Structure and Supports | US37 |
| | 5.3.4 | Assembly and Installation | RU6 US04 US10 US11 US37 US53 |
| | 5.3.5 | Monitoring | US04 US10 US37 |
| | 5.3.6 | Service Systems | US10 US37 US53 |
| Barrel RPC | 5.4.1 | Detectors and Components | BG1 BG2 CN3 IT01 IT07 IT13 |
| | 5.4.2 | Electronics | CN3 IT01 IT07 IT13 |
| | 5.4.3 | Mechanical Structure and Supports | CN3 IT13 |
| | 5.4.4 | Assembly and Installation | BG1 BG2 CN3 IT01 IT07 IT13 IT15 |
| | 5.4.5 | Monitoring | CN3 IT01 IT07 IT13 IT15 |
| | 5.4.6 | Service Systems | CN3 IT01 IT07 IT13 |
| Forward RPC | 5.5.1 | Detectors and Components | CN3 KR01 KR02 KR03 KR04 KR05 KR06 KR07 KR08 KR09 KR10 KR11 KR12 KR13 |
| | 5.5.2 | Electronics | CN3 KR01 KR02 KR03 KR04 KR05 KR06 KR07 KR08 KR09 KR10 KR11 KR12 KR13 PK1 |
| | 5.5.3 | Mechanical Structure and Supports | CN3 KR01 KR02 KR03 KR04 KR05 KR06 KR07 KR08 KR09 KR10 KR11 KR12 KR13 PK1 |
| | 5.5.4 | Assembly and Installation | CN3 KR01 KR02 KR03 KR04 KR05 KR06 KR07 KR08 KR09 KR10 KR11 KR12 KR13 PK1 |
| | 5.5.5 | Monitoring | CN3 KR01 KR02 KR03 KR04 KR05 KR06 KR07 KR08 KR09 KR10 KR11 KR12 KR13 PK1 |
| | 5.5.6 | Service Systems | CN3 KR01 KR02 KR03 KR04 KR05 KR06 KR07 KR08 KR09 KR10 KR11 KR12 KR13 PK1 |
| Alignment | 5.6.1 | Barrel | AT1 CERN HU2 |
| | 5.6.2 | Forward | US10 US25 |
| | 5.6.3 | Link | SP1 SP2 SP3 SP4 |

8.5B Deliverables & Assigned Funding for the individual Sub-detectors by Funding Agency

Best Estimate of Assigned Funds as per Signed MoU and its Amendments

| Subsystem | Item | kCHF | | % Participation | | | | | | | | | | | | | Total Funding | |
|----------------------------------|-----------------------------------------|---------|--------|-----------------|----------|--------|--------|---------|---------|--------|--------|----------|----------|-------------|---------|-------------------|---------------|-------------------|
| | | EA Name | | Austria | Bulgaria | CERN | China | Germany | Hungary | Italy | Korea | Pakistan | RDMS-DMS | RDMS-Russia | Spain | United States-DOE | | United States-NSF |
| 5.1. Barrel Drifttubes | 5.1.1 Detectors and Components | | | | | | 26.00% | | 52.26% | | | | | | 21.74% | | | 10,249 |
| | 5.1.2 Electronics | | | 6.45% | | 6.07% | 17.89% | | 59.19% | | | | | | 10.40% | | | 13,175 |
| | 5.1.3 Mechanical Structure and Supports | | | | 31.96% | 17.44% | | 31.96% | | | | | | | 18.63% | | | 1,095 |
| | 5.1.4 Assembly and Installation | | | | | 33.33% | | 42.26% | | | | | | | 24.41% | | | 807 |
| | 5.1.6 Service Systems | | | 25.66% | | 27.80% | | 31.74% | | | | | | | 14.80% | | | 1,169 |
| | 5.1. Barrel Drifttubes Total | | | 4.34% | 4.34% | 21.91% | | 53.66% | | | | | | | 15.75% | | | 26,495 |
| 5.2. Forward ME 1/1 | 5.2.1 Detectors and Components | | | | | | | | | | | | 100.00% | | | | | 1,765 |
| | 5.2.2 Electronics | | | | | | | | | | | 23.14% | 3.39% | | 54.95% | 18.51% | | 3,241 |
| | 5.2.3 Mechanical Structure, Supports | | | | | | | | | | | 47.62% | 52.38% | | | | | 210 |
| | 5.2.4 Assembly and Installation | | | | | | | | | | | 15.38% | 84.62% | | | | | 325 |
| | 5.2.5 Monitoring | | | | | | | | | | | 100.00% | | | | | | 50 |
| | 5.2.6 Service Systems | | | | | | | | | | | 50.00% | 50.00% | | | | | 100 |
| 5.2. Forward ME 1/1 Total | | | | | | | | | | | 17.57% | 40.59% | | 31.29% | 10.54% | | 5,691 | |
| 5.3. Endcap CSC | 5.3.1 Detectors and Components | | | | 12.65% | | | | | | | | | | | | | 11,855 |
| | 5.3.2 Electronics | | | | | | | | | | | | | | 74.69% | | | 12,034 |
| | 5.3.3 Mechanical Structure and Supports | | | | | | | | | | | | | | 94.40% | 5.60% | | 430 |
| | 5.3.4 Assembly and Installation | | | | | | | | | | | | | | 100.00% | | | 260 |
| | 5.3.5 Monitoring | | | | | | | | | | | | | | 100.00% | | | 323 |
| | 5.3.6 Service Systems | | | | | | | | | | | | | | 100.00% | | | 1,183 |
| 5.3. Endcap CSC Total | | | | 5.75% | | | | | | | | | 5.75% | 85.92% | 2.58% | | 26,085 | |
| 5.4. Barrel RPC | 5.4.1 Detectors and Components | | 15.96% | | | | | | 84.04% | | | | | | | | | 3,760 |
| | 5.4.2 Electronics | | | | | | | | 100.00% | | | | | | | | | 1,770 |
| | 5.4.3 Mechanical Structure and Supports | | | | 100.00% | | | | | | | | | | | | | 100 |
| | 5.4.4 Assembly and Installation | | | | | | | | 100.00% | | | | | | | | | 160 |
| | 5.4.5 Monitoring | | | | | | | | 100.00% | | | | | | | | | 100 |
| | 5.4.6 Service Systems | | | | | | | | 100.00% | | | | | | | | | 420 |
| 5.4. Barrel RPC Total | | 9.51% | | 1.58% | | | | 88.91% | | | | | | | | | | 6,310 |
| 5.5. Forward RPC | 5.5.1 Detectors and Components | | | | 23.40% | | | | 53.19% | 23.40% | | | | | | | | 940 |
| | 5.5.2 Electronics | | | | | | | | 100.00% | | | | | | | | | 330 |
| | 5.5.3 Mechanical Structure and Supports | | | | 34.21% | | | | 65.79% | | | | | | | | | 380 |
| | 5.5.4 Assembly and Installation | | | | | | | | 100.00% | | | | | | | | | 200 |
| | 5.5.5 Monitoring | | | | | | | | 100.00% | | | | | | | | | 60 |
| | 5.5.6 Service Systems | | | | | | | | 100.00% | | | | | | | | | 760 |
| 5.5. Forward RPC Total | | | | 13.11% | | | | 18.73% | 68.16% | | | | | | | | | 2,670 |
| 5.6. Alignment | 5.6.1 Barrel | | 3.85% | | 88.46% | | | 7.69% | | | | | | | | | | 1,300 |
| | 5.6.2 Forward | | | | | | | | | | | | | | 19.50% | 80.50% | | 1,041 |
| | 5.6.3 Link | | | | | | | | | | | | | 100.00% | | | | 1,368 |
| 5.6. Alignment Total | | 1.34% | | 30.84% | | | 2.68% | | | | | | | 37.22% | 5.45% | 22.48% | | 3,729 |
| Grand Total | | 0.07% | 0.85% | 3.24% | 4.37% | 8.18% | 0.14% | 27.93% | 0.70% | 2.56% | 1.41% | 5.37% | 7.83% | 34.37% | 2.98% | | | 70,980 |

8.6 Trigger and Data Acquisition**8.6A Deliverables to be provided by the Institutes for the individual Sub-detectors**

See Annex 1 for the abbreviations of the names of Institutes

| Deliverables and Institutes | | | |
|-----------------------------|-------|---------------------|----------------------------------------------------------------------------------------------|
| Subsystem Name | Ref. | Deliverables | Institutes |
| Data Acquisition | 6.2.1 | Event Filter | CERN DE7 GR1 GR2 GR3 IT06 IT11 SW1 SW2 UK3 |
| | 6.2.2 | Readout Builder | AT1 CERN FR3 HU1 SW1 SW2 US04 US06 US10 US16 US18 US21 |
| | 6.2.3 | Data to Surface | CERN SW1 US10 US21 |
| | 6.2.4 | Detector Controls | CERN IT06 |
| | 6.2.5 | Preseries | CERN US04 US06 US10 US16 US21 |
| | 6.2.6 | DAQ Integration | CERN |
| Trigger | 6.1.1 | Calorimeter Trigger | SP1 SP2 SP3 SP4 PT1 UK4 US37 US46 US47 US53 |
| | 6.1.2 | CSC Trigger | US03 US04 US08 US11 US21 US28 US31 |
| | 6.1.3 | DT Trigger | AT1 IT02 |
| | 6.1.4 | RPC Trigger | FI1 FI2 FI7 IT01 KR01 KR02 KR03 KR04 KR05 KR06 KR07 KR08 KR09 KR10 KR11 KR12 KR13 PL1 PL2 |
| | 6.1.5 | Global Trigger | AT1 CERN GR1 GR2 GR3 |

8.6B Deliverables & Assigned Funding for the individual Sub-detectors by Funding Agency

Best Estimate of Assigned Funds as per Signed MoU and its Amendments

| Subsystem | Item | % Participation | | | | | | | | | | | | | Total Funding | |
|-----------------------|------------------------------------|-----------------|---------------|--------------|---------------|--------------|--------------|--------------|--------------|---------------|--------------|------------------|-----------------|----------------|---------------|-------------------|
| | | Austria | CERN | Finland | France-CEA | Greece | Hungary | Italy | Korea | Poland | Portugal | Switzerland-ETHZ | Switzerland-FSI | United Kingdom | | United States-DOE |
| | 6.1.1 Calorimeter Trigger | | | | | | | | | | 5.23% | | | 8.20% | 86.57% | 4,876 |
| 6.1. Trigger | 6.1.2 CSC Trigger | | | | | | | | | | | | | | 100.00% | 1,740 |
| | 6.1.3 DT Trigger | 93.73% | | | | | | 6.27% | | | | | | | | 846 |
| | 6.1.4 RPC Trigger | | | 32.62% | | | | 1.50% | | 65.88% | | | | | | 3,127 |
| | 6.1.5 Global Trigger | 100.00% | | | | | | | | | | | | | | 507 |
| | 6.1. Trigger Total | 11.72% | | 9.19% | | | | 0.90% | | 18.57% | 2.30% | | | 3.60% | 53.72% | 11,096 |
| 6.2. Data Acquisition | 6.2.1 Event Filter | | | | 16.06% | 39.39% | 1.72% | | 9.56% | | | | 26.58% | 6.69% | | 5,230 |
| | 6.2.2 Readout Builder | | 72.65% | | | | | | | | | | | | 24.23% | 4,802 |
| | 6.2.3 Data to Surface | | 32.21% | | | | | | | | | | 14.51% | | 42.58% | 4,204 |
| | 6.2.4 Detector Controls | | 100.00% | | | | | | | | | | | | | 920 |
| | 6.2.5 Preseries | | 55.14% | | | | | | | | | | | | 44.86% | 1,339 |
| | 6.2.6 DAQ Integration | | 100.00% | | | | | | | | | | | | | 969 |
| | 6.2. Data Acquisition Total | 42.77% | | 4.81% | 11.80% | 0.52% | | 2.86% | | 11.45% | 2.86% | 2.58% | 20.35% | | 17,464 | |
| | Grand Total | 4.55% | 26.16% | 3.57% | 2.94% | 7.21% | 0.32% | 0.35% | 1.75% | 7.21% | 0.89% | 7.00% | 1.75% | 2.98% | 33.32% | 28,560 |

8.7 The OFFLINE COMPUTING Sub-system is part of the common costs and listed in Annex 7

8.8 The INFRASTRUCTURE Sub-system is part of the common costs and listed in Annex 7

8.9 The COMMISSIONING AND INTEGRATION Sub-system is part of the common costs and listed in Annex 7

Annex 9: Category A Headings for CMS M&O Costs Categorisation

| Description | Ref. | Details |
|------------------------------------|--------|-------------------------------------------------|
| Detector related costs | A.1.01 | Magnet |
| | A.1.02 | Magnet controls |
| | A.1.03 | Magnet power supply |
| | A.1.04 | Gas systems |
| | A.1.05 | Gas consumption |
| | A.1.06 | Cooling systems |
| | A.1.07 | Cooling fluids(above -50°C) |
| | A.1.08 | External cryogenics |
| | A.1.09 | Cryogenic fluids (below -50°C) |
| | A.1.10 | Moving/hydraulic systems |
| | A.1.11 | Detector safety systems |
| | A.1.12 | Shutdown activities |
| | A.1.13 | General Technical support |
| | A.1.14 | UPS maintenance |
| | A.1.15 | Electronics pool rentals |
| | A.1.16 | Beam pipe & vacuum |
| | A.1.17 | Counting & control rooms |
| Secretariat | A.2.01 | Secretarial assistance |
| | A.2.02 | Economat |
| | A.2.04 | Printing and publication |
| Communications | A.3.01 | GSM phones; on-call service |
| | A.3.02 | Automatic call-back |
| On-line computing | A.4.01 | System management |
| | A.4.02 | Data storage, (temporary on disk) |
| | A.4.03 | Detector controls |
| | A.4.04 | Computers/processors/LANs |
| | A.4.05 | Software licenses |
| Test beams, calibration facilities | A.5.01 | General operation |
| | A.5.02 | Common electronics |
| | A.5.03 | Electronics pool rentals |
| | A.5.04 | Gas systems |
| | A.5.05 | Gas consumption |
| | A.5.06 | External cryogenics |

| Description | Ref. | Details |
|------------------------------------------|--------|-------------------------------|
| Laboratory operations | A.6.01 | Assembly areas, clean rooms |
| | A.6.02 | Workshops |
| | A.6.03 | Laboratory instruments |
| General services | A.7.01 | Cooling & ventilation |
| | A.7.03 | Power distribution system |
| | A.7.04 | Heavy transport |
| | A.7.05 | Cranes |
| | A.7.06 | Cars |
| | A.7.08 | Survey |
| | A.7.09 | Storage space |
| | A.7.10 | Common desktop infrastructure |
| | A.7.11 | Academic Subsistence |
| | A.7.12 | Outreach |
| Electricity | A.8.01 | Power Consumption |
| Core Computing Infrastructure & Services | A.9.01 | Central computing environment |
| | A.9.02 | Software process service |
| | A.9.03 | User support |
| | A.9.04 | Central production operations |
| | A.9.05 | Hardware |

Annex 10: Category B Headings for CMS M&O Costs Categorisation.

| Description | Ref. | Details |
|------------------------------|--------|-----------------------------------|
| Material Resources (kCHF) | B.1.01 | Mechanics |
| | B.1.02 | Gas-system |
| | B.1.03 | Cryo-system |
| | B.1.04 | Cooling system |
| | B.1.05 | FE electronics |
| | B.1.06 | Standard electronics, PS (LV, HV) |
| | B.1.07 | Standard electronics, Crates |
| | B.1.08 | Standard electronics, RO Modules |
| | B.1.09 | Controls, (DCS, DSS) |
| | B.1.10 | Sub-Detector Spares |
| | B.1.11 | Areas |
| | B.1.12 | Communications |
| | B.1.13 | Store Items |
| | B.1.14 | Hired Manpower @CERN |
| Human Resources (FTE) | B.2.01 | Technical Manpower @CERN |
| | B.2.02 | Core Computing Manpower @CMS |

Annex 11: Category C Headings for CMS M&O Costs Categorisation.

General services

- Safety & radioprotection
- INB compliance
- Radioactive waste disposal
- Access system
- Elevators
- Gerant de site
- Flood control
- Insurance (CERN standard)
- Cleaning
- Office space

Annex 12: Rules of Procedure for the M&O Scrutiny Group

- 12.1 The RRBs of the LHC experiments, acting together, shall appoint a Scrutiny Group to assist them in exercising their duties with respect to the oversight of M&O costs and the approval of M&O spending for the coming year. The Scrutiny Group has a technical role and shall be composed of six persons chosen appropriately by the RRBs acting jointly and four persons chosen by CERN. The Scrutiny Group shall perform its duties for all of the LHC Collaborations. The members chosen by the RRBs shall normally include at least one person from each of a large Member State, a small Member State, a large non-Member State and a small non-Member State.
- 12.2 In order to promote continuity in its deliberations, appointments to the Scrutiny Group shall normally be for two years, with the possibility of re-appointment. Half of the members chosen by the RRBs and half of those chosen by CERN will be replaced each year. In order to establish this rolling replacement, half of the initial members of the Scrutiny Group will serve for three years.
- 12.3 The names of new Scrutiny Group members for the current and following year will normally be settled at the spring meeting of the RRBs. For the members to be chosen by the RRBs, the RRB Chairperson will receive nominations. CERN will inform the RRBs of its choice of members. The RRBs will then appoint the Scrutiny Group members by consensus in plenary session.
- 12.4 The Scrutiny Group shall select its Chairperson from amongst the members chosen by the RRBs.
- 12.5 At his or her discretion, the Chairperson of the Scrutiny Group will accept that, in exceptional circumstances, a member is replaced at an individual meeting by a named proxy.
- 12.6 The Scrutiny Group will receive for scrutiny, normally at the spring meetings of the RRBs, the Collaborations' proposals concerning the level, provision and sharing of Category A M&O costs for the following year, along with their reported Category B costs and the proposed responsibilities and commitments for these. It will then carry out its scrutiny activities and will submit its reports for each experiment to the autumn meetings of the RRBs.

Annex 13: Participants in the CMS Collaboration (as registered by September 11, 2017)

13.1 Scientific staff in the CMS Collaboration holding PhD or equivalent qualifications.

ANNEX 13.A

2018 Updated List of PhD Scientists

(Count closed on September 11, 2017)

| FA | Institute | Full Name |
|--------------|---------------|-----------------------------|
| Austria | HEPHY | Adam Wolfgang |
| Austria | HEPHY | Bergauer Thomas |
| Austria | HEPHY | Dragicevic Marko Gerhart |
| Austria | HEPHY | Ero Janos |
| Austria | HEPHY | Escalante Del Valle Alberto |
| Austria | HEPHY | Flechl Martin |
| Austria | HEPHY | Friedl Markus |
| Austria | HEPHY | Fruhirth Rudolf |
| Austria | HEPHY | Ghete Vasile Mihai |
| Austria | HEPHY | Jeitler Manfred |
| Austria | HEPHY | Kratschmer Ilse |
| Austria | HEPHY | Liko Dietrich |
| Austria | HEPHY | Mikulec Ivan |
| Austria | HEPHY | Schieck Jochen |
| Austria | HEPHY | Schoefbeck Robert |
| Austria | HEPHY | Waltenberger Wolfgang |
| Austria | HEPHY | Wittmann Johannes |
| Austria | HEPHY | Wulz Claudia |
| Belgium-FNRS | BRUXELLES-ULB | Bilin Bugra |
| Belgium-FNRS | BRUXELLES-ULB | Brun Hugues Louis |
| Belgium-FNRS | BRUXELLES-ULB | Clerbaux Barbara |
| Belgium-FNRS | BRUXELLES-ULB | De Lentdecker Gilles W.P. |
| Belgium-FNRS | BRUXELLES-ULB | Dorney Brian L |
| Belgium-FNRS | BRUXELLES-ULB | Favart Laurent |
| Belgium-FNRS | BRUXELLES-ULB | Goldouzian Reza |
| Belgium-FNRS | BRUXELLES-ULB | Grebenyuk Anastasia |
| Belgium-FNRS | BRUXELLES-ULB | Kalsi Amandeep Kaur |
| Belgium-FNRS | BRUXELLES-ULB | Lenzi Thomas |
| Belgium-FNRS | BRUXELLES-ULB | Luetic Jelena |
| Belgium-FNRS | BRUXELLES-ULB | Marinov Andrey Rumenov |
| Belgium-FNRS | BRUXELLES-ULB | Vanlaer Pascal |
| Belgium-FNRS | LOUVAIN | Bakhshiansohi Hamed |
| Belgium-FNRS | LOUVAIN | Bondu Olivier |
| Belgium-FNRS | LOUVAIN | Brochet Sebastien |

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| Belgium-FNRS | LOUVAIN | Bruno Giacomo |
| Belgium-FNRS | LOUVAIN | David Pieter |
| Belgium-FNRS | LOUVAIN | Delaere Christophe |
| Belgium-FNRS | LOUVAIN | Giammanco Andrea |
| Belgium-FNRS | LOUVAIN | Lemaitre Vincent |
| Belgium-FNRS | LOUVAIN | Musich Marco |
| Belgium-FNRS | LOUVAIN | Piotrkowski Krzysztof |
| Belgium-FNRS | LOUVAIN | Vidal Marono Miguel |
| Belgium-FWO | ANTWERPEN | Janssen Xavier Jean-marie |
| Belgium-FWO | ANTWERPEN | Van Haevermaet Hans |
| Belgium-FWO | ANTWERPEN | Van Mechelen Pierre |
| Belgium-FWO | ANTWERPEN | Van Remortel Nick |
| Belgium-FWO | BRUSSEL-VUB | Blekman Freya |
| Belgium-FWO | BRUSSEL-VUB | D'Hondt Jorgen |
| Belgium-FWO | BRUSSEL-VUB | Flouris Giannis |
| Belgium-FWO | BRUSSEL-VUB | Lontkovskyi Denys |
| Belgium-FWO | BRUSSEL-VUB | Lowette Steven |
| Belgium-FWO | BRUSSEL-VUB | Marchesini Ivan |
| Belgium-FWO | BRUSSEL-VUB | Skovpen Kirill |
| Belgium-FWO | BRUSSEL-VUB | Van Mulders Petra Karel Ann |
| Belgium-FWO | GHENT | Cornelis Tom |
| Belgium-FWO | GHENT | Dobur Didar |
| Belgium-FWO | GHENT | Trocino Daniele |
| Belgium-FWO | GHENT | Tytgat Michael |
| Belgium-FWO | GHENT | Zaganidis Nicolas |
| Brazil | RIO-CBPF | Alves Gilvan Augusto |
| Brazil | RIO-CBPF | Hensel Carsten |
| Brazil | RIO-CBPF | Moraes Arthur |
| Brazil | RIO-CBPF | Pol Maria Elena |
| Brazil | RIO-CBPF | Rebello Teles Patricia |
| Brazil | RIO-UERJ | Carvalho Wagner De Paula |
| Brazil | RIO-UERJ | Chinellato Jose Augusto |
| Brazil | RIO-UERJ | Da Costa Elisa Melo |
| Brazil | RIO-UERJ | Da Silveira Gustavo Gil |
| Brazil | RIO-UERJ | De Jesus Damiao Dilson |
| Brazil | RIO-UERJ | De Oliveira Martins Carley Pedro |
| Brazil | RIO-UERJ | Fonseca De Souza Sandro |
| Brazil | RIO-UERJ | Malbouisson Brandao Helena |
| Brazil | RIO-UERJ | Mora Herrera Clemencia |
| Brazil | RIO-UERJ | Mundim Luiz |
| Brazil | RIO-UERJ | Nogima Helio |
| Brazil | RIO-UERJ | Prado Da Silva Wanda Lucia |
| Brazil | RIO-UERJ | Santoro Alberto |

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| Brazil | RIO-UERJ | Sznajder Andre |
| Brazil | RIO-UERJ | Tonelli Manganote Edmilson Jose |
| Brazil | RIO-UERJ | Vilela Pereira Antonio |
| Brazil | SAO_PAULO | Ahuja Sudha |
| Brazil | SAO_PAULO | Bernardes Cesar Augusto |
| Brazil | SAO_PAULO | De Moraes Gregores Eduardo |
| Brazil | SAO_PAULO | Fernandez Perez Tomei Thiago Rafael |
| Brazil | SAO_PAULO | Mercadante Pedro |
| Brazil | SAO_PAULO | Novaes Sergio |
| Brazil | SAO_PAULO | Padula Sandra |
| Bulgaria | SOFIA-INRNE | Aleksandrov Aleksandar |
| Bulgaria | SOFIA-INRNE | Hadjiiska Roumyana Mileva |
| Bulgaria | SOFIA-INRNE | Iaydjiev Plamen |
| Bulgaria | SOFIA-INRNE | Soultanov Gueorgui |
| Bulgaria | SOFIA-UNIV | Dimitrov Anton |
| Bulgaria | SOFIA-UNIV | Litov Leandar |
| Bulgaria | SOFIA-UNIV | Pavlov Borislav |
| Bulgaria | SOFIA-UNIV | Petkov Peicho Stoev |
| CERN | CERN | Abbaneo Duccio |
| CERN | CERN | Akgun Bora |
| CERN | CERN | Alipour Tehrani Niloufar |
| CERN | CERN | Auffray Hillemanns Etiennette |
| CERN | CERN | Ball Austin |
| CERN | CERN | Barney David |
| CERN | CERN | Bendavid Joshua Lorne |
| CERN | CERN | Bianco Michele |
| CERN | CERN | Bocci Andrea |
| CERN | CERN | Botta Cristina |
| CERN | CERN | Camporesi Tiziano |
| CERN | CERN | Cepeda Maria Luisa |
| CERN | CERN | Cerminara Gianluca |
| CERN | CERN | Chapon Emilien |
| CERN | CERN | Chen Yi |
| CERN | CERN | Cucciati Giacomo |
| CERN | CERN | d'Enterria David |
| CERN | CERN | Dabrowski Anne |
| CERN | CERN | David Tinoco Mendes Andre |
| CERN | CERN | De Roeck Albert |
| CERN | CERN | Dobson Marc |
| CERN | CERN | Dunser Marc Fabio |
| CERN | CERN | Dupont Niels Aurelien |
| CERN | CERN | Franzoni Giovanni |
| CERN | CERN | Fulcher Jonathan Richard |

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| CERN | CERN | Gigi Dominique |
| CERN | CERN | Gilbert Andrew James |
| CERN | CERN | Gill Karl Aaron |
| CERN | CERN | Glege Frank |
| CERN | CERN | Hegeman Jeroen Guido |
| CERN | CERN | Innocente Vincenzo |
| CERN | CERN | Jafari Abideh |
| CERN | CERN | Janot Patrick |
| CERN | CERN | Karacheban Olena |
| CERN | CERN | Kieseler Jan |
| CERN | CERN | Kornmayer Andreas |
| CERN | CERN | Kortelainen Matti Johannes |
| CERN | CERN | Lange Clemens |
| CERN | CERN | Lourenco Carlos |
| CERN | CERN | Malgeri Luca |
| CERN | CERN | Mannelli Marcello |
| CERN | CERN | Martelli Arabella |
| CERN | CERN | Meijers Franciscus |
| CERN | CERN | Mersi Stefano |
| CERN | CERN | Meschi Emilio |
| CERN | CERN | Milenovic Predrag |
| CERN | CERN | Moortgat Filip Wim |
| CERN | CERN | Mulders Martijn |
| CERN | CERN | Orfanelli Stella |
| CERN | CERN | Orsini Luciano |
| CERN | CERN | Perez Emmanuel |
| CERN | CERN | Peruzzi Marco |
| CERN | CERN | Petrilli Achille |
| CERN | CERN | Petrucciani Giovanni |
| CERN | CERN | Pfeiffer Andreas |
| CERN | CERN | Pierini Maurizio |
| CERN | CERN | Rabady Dinyar Sebastian |
| CERN | CERN | Racz Attila |
| CERN | CERN | Reis Thomas |
| CERN | CERN | Rolandi Luigi |
| CERN | CERN | Rovere Marco |
| CERN | CERN | Sakulin Hannes |
| CERN | CERN | Schwick Christoph |
| CERN | CERN | Seidel Markus |
| CERN | CERN | Selvaggi Michele |
| CERN | CERN | Sharma Archana |
| CERN | CERN | Sphicas Paraskevas |
| CERN | CERN | Steggemann Jan |

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| CERN | CERN | Tosi Mia |
| CERN | CERN | Tsirou Andromachi |
| CERN | CERN | Verweij Marta |
| CERN | CERN | Vieira de Castro Ferreira da Silva Pedro Manuel |
| CERN | CERN | Zeuner Wolfram Dietrich |
| China | BEIJING-BUAA | Shen Chengping |
| China | BEIJING-BUAA | Yuan Li |
| China | BEIJING-IHEP | Ahmad Muhammad |
| China | BEIJING-IHEP | Bian Jianguo |
| China | BEIJING-IHEP | Chen Ye |
| China | BEIJING-IHEP | Chen Hesheng |
| China | BEIJING-IHEP | Chen Mingshui |
| China | BEIJING-IHEP | Chen Guoming |
| China | BEIJING-IHEP | Leggat Duncan Alexander |
| China | BEIJING-IHEP | Liao Hongbo |
| China | BEIJING-IHEP | Liu Zhenan |
| China | BEIJING-IHEP | Romeo Francesco |
| China | BEIJING-IHEP | Spiezia Aniello |
| China | BEIJING-IHEP | Tao Junquan |
| China | BEIJING-IHEP | Yazgan Efe |
| China | BEIJING-IHEP | Zhang Huaqiao |
| China | BEIJING-IHEP | Zhao Jingzhou |
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| China | PEKING-UNIV | Li Qiang |
| China | PEKING-UNIV | Mao Yajun |
| China | PEKING-UNIV | Wang Dayong |
| Colombia | UNIANDES | Avila Bernal Carlos Arturo |
| Colombia | UNIANDES | Carrillo Montoya Camilo Andres |
| Colombia | UNIANDES | Florez Bustos Carlos Andres |
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| Croatia | SPLIT-FESB | Lelas Damir |
| Croatia | SPLIT-FESB | Puljak Ivica |
| Croatia | SPLIT-UNIV | Kovac Marko |
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| Croatia | ZAGREB-RUDJER | Ceci Sasa |
| Croatia | ZAGREB-RUDJER | Ferencek Dinko |
| Croatia | ZAGREB-RUDJER | Kadija Kreso |
| Croatia | ZAGREB-RUDJER | Starodumov Andrey |
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| Cyprus | NICOSIA-UNIV | Mousa Jehad |
| Cyprus | NICOSIA-UNIV | Nicolaou Charalambos |
| Cyprus | NICOSIA-UNIV | Ptochos Fotios |
| Cyprus | NICOSIA-UNIV | Razis Panos |
| Ecuador | QUITO-EPN | Ayala Amaya Edy Rodrigo |
| Ecuador | QUITO-USFQ | Carrera Jarrin Edgar Fernando |
| Egypt | ASRT-ENHEP | Abdelalim Ahmed Ali |
| Egypt | ASRT-ENHEP | Assran Yasser |
| Egypt | ASRT-ENHEP | Elgammal Sherif |
| Estonia | TALLINN | Dewanjee Ram Krishna |
| Estonia | TALLINN | Kadastik Mario |
| Estonia | TALLINN | Raidal Martti |
| Estonia | TALLINN | Veelken Christian |
| Finland | HELSINKI-HIP | Lampen Pekka Tapio |
| Finland | HELSINKI-HIP | Lassila-Perini Katri |
| Finland | HELSINKI-HIP | Lehti Sami |
| Finland | HELSINKI-HIP | Linden Tomas |
| Finland | HELSINKI-HIP | Luukka Panja |
| Finland | HELSINKI-HIP | Tuominen Eija |
| Finland | HELSINKI-UNIV | Eerola Paula Anna-maria |
| Finland | HELSINKI-UNIV | Kirschenmann Henning |
| Finland | HELSINKI-UNIV | Voutilainen Mikko |
| Finland | LAPPEENRANTA-LUT | Tuuva Tuure |
| France-CEA | SACLAY | Besancon Marc |
| France-CEA | SACLAY | Couderc Fabrice |
| France-CEA | SACLAY | Dejardin Marc |
| France-CEA | SACLAY | Faure Jean-Louis |
| France-CEA | SACLAY | Ferri Federico |
| France-CEA | SACLAY | Ganjour Serguei |
| France-CEA | SACLAY | Gras Philippe |
| France-CEA | SACLAY | Hamel de Monchenault Gautier |
| France-CEA | SACLAY | Jarry Patrick |
| France-CEA | SACLAY | Locci Elizabeth |
| France-CEA | SACLAY | Malcles Julie |
| France-CEA | SACLAY | Rosowsky Andre |
| France-CEA | SACLAY | Sahin Mehmet Ozgur |
| France-CEA | SACLAY | Titov Maksym |
| France-IN2P3 | LYON | Beauceron Stephanie |
| France-IN2P3 | LYON | Bernet Colin |
| France-IN2P3 | LYON | Boudoul Gaele |
| France-IN2P3 | LYON | Chierici Roberto |

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| France-IN2P3 | LYON | Contardo Didier |
| France-IN2P3 | LYON | Depasse Pierre |
| France-IN2P3 | LYON | El Mamouni Houmani |
| France-IN2P3 | LYON | Gascon-Shotkin Susan Mary |
| France-IN2P3 | LYON | Gouzevitch Maxime |
| France-IN2P3 | LYON | Grenier Gerald |
| France-IN2P3 | LYON | Laktineh Laktineh |
| France-IN2P3 | LYON | Lethuillier Morgan Michel |
| France-IN2P3 | LYON | Mirabito Laurent |
| France-IN2P3 | LYON | Perries Stephane |
| France-IN2P3 | LYON | Sordini Viola |
| France-IN2P3 | LYON | Vander Donckt Muriel |
| France-IN2P3 | LYON | Viret Sebastien |
| France-IN2P3 | LYON_CC | Gadrat Sebastien |
| France-IN2P3 | POLYTECHNIQUE | Beaudette Florian |
| France-IN2P3 | POLYTECHNIQUE | Busson Philippe |
| France-IN2P3 | POLYTECHNIQUE | Charlot Claude |
| France-IN2P3 | POLYTECHNIQUE | Granier De Cassagnac Raphael |
| France-IN2P3 | POLYTECHNIQUE | Kucher Inna |
| France-IN2P3 | POLYTECHNIQUE | Lobanov Artur |
| France-IN2P3 | POLYTECHNIQUE | Martin Blanco Javier |
| France-IN2P3 | POLYTECHNIQUE | Nguyen Matthew |
| France-IN2P3 | POLYTECHNIQUE | Ochando Christophe |
| France-IN2P3 | POLYTECHNIQUE | Ortona Giacomo |
| France-IN2P3 | POLYTECHNIQUE | Salerno Roberto Antonio |
| France-IN2P3 | POLYTECHNIQUE | Sauvan Jean-baptiste |
| France-IN2P3 | POLYTECHNIQUE | Sirois Yves |
| France-IN2P3 | POLYTECHNIQUE | Zabi Alexandre |
| France-IN2P3 | POLYTECHNIQUE | Zghiche Amina |
| France-IN2P3 | STRASBOURG | Agram Jean-Laurent |
| France-IN2P3 | STRASBOURG | Andrea Jeremy |
| France-IN2P3 | STRASBOURG | Bloch Daniel |
| France-IN2P3 | STRASBOURG | Brom Jean-Marie |
| France-IN2P3 | STRASBOURG | Chabert Eric Christian |
| France-IN2P3 | STRASBOURG | Cherepanov Vladimir |
| France-IN2P3 | STRASBOURG | Collard Caroline |
| France-IN2P3 | STRASBOURG | Conte Eric Roger Eugene |
| France-IN2P3 | STRASBOURG | Fontaine Jean-Charles |
| France-IN2P3 | STRASBOURG | Gele Denis |
| France-IN2P3 | STRASBOURG | Goerlach Ulrich |
| France-IN2P3 | STRASBOURG | Le Bihan Anne-Catherine |
| France-IN2P3 | STRASBOURG | Van Hove Pierre |
| Germany-BMBF | AACHEN-1 | Autermann Christian |

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| Germany-BMBF | AACHEN-1 | Feld Lutz Werner |
| Germany-BMBF | AACHEN-1 | Klein Katja |
| Germany-BMBF | AACHEN-3A | Erdmann Martin |
| Germany-BMBF | AACHEN-3A | Hebbeker Thomas |
| Germany-BMBF | AACHEN-3A | Heidemann Carsten Andreas |
| Germany-BMBF | AACHEN-3A | Hoepfner Kerstin |
| Germany-BMBF | AACHEN-3A | Merschmeyer Markus Karl |
| Germany-BMBF | AACHEN-3A | Meyer Arnd |
| Germany-BMBF | AACHEN-3A | Mukherjee Swagata |
| Germany-BMBF | AACHEN-3A | Teyssier Daniel Francois |
| Germany-BMBF | AACHEN-3B | Kress Thomas |
| Germany-BMBF | AACHEN-3B | Muller Thomas |
| Germany-BMBF | AACHEN-3B | Nowack Andreas Stefan |
| Germany-BMBF | AACHEN-3B | Pooth Oliver |
| Germany-BMBF | AACHEN-3B | Sert Hale |
| Germany-BMBF | AACHEN-3B | Stahl Achim |
| Germany-BMBF | HAMBURG-UNIV | Aggleton Robin Cameron |
| Germany-BMBF | HAMBURG-UNIV | Bein Samuel Louis |
| Germany-BMBF | HAMBURG-UNIV | Ebrahimi Aliakbar |
| Germany-BMBF | HAMBURG-UNIV | Garutti Erika |
| Germany-BMBF | HAMBURG-UNIV | Haller Johannes |
| Germany-BMBF | HAMBURG-UNIV | Hinzmann Andreas Dominik |
| Germany-BMBF | HAMBURG-UNIV | Karavdina Anastasia |
| Germany-BMBF | HAMBURG-UNIV | Kogler Roman |
| Germany-BMBF | HAMBURG-UNIV | Perieanu Adrian |
| Germany-BMBF | HAMBURG-UNIV | Schleper Peter |
| Germany-BMBF | HAMBURG-UNIV | Schwandt Joern |
| Germany-BMBF | HAMBURG-UNIV | Sonneveld Jorine Mirjam |
| Germany-BMBF | HAMBURG-UNIV | Stadie Hartmut |
| Germany-BMBF | HAMBURG-UNIV | Steinbrueck Georg |
| Germany-BMBF | HAMBURG-UNIV | Stober Fred-Markus Helmut |
| Germany-BMBF | HAMBURG-UNIV | Vormwald Benedikt Roland |
| Germany-BMBF | KARLSRUHE-IEKP | Barth Christian |
| Germany-BMBF | KARLSRUHE-IEKP | Baselga Bacardit Marta |
| Germany-BMBF | KARLSRUHE-IEKP | Butz Erik Manuel |
| Germany-BMBF | KARLSRUHE-IEKP | Chwalek Thorsten |
| Germany-BMBF | KARLSRUHE-IEKP | De Boer Willem |
| Germany-BMBF | KARLSRUHE-IEKP | Dierlamm Alexander Hermann |
| Germany-BMBF | KARLSRUHE-IEKP | Giffels Manuel |
| Germany-BMBF | KARLSRUHE-IEKP | Hartmann Frank |
| Germany-BMBF | KARLSRUHE-IEKP | Husemann Ulrich |
| Germany-BMBF | KARLSRUHE-IEKP | Katkov Igor |
| Germany-BMBF | KARLSRUHE-IEKP | Mozer Matthias U. |

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| Germany-BMBF | KARLSRUHE-IEKP | Muller Thomas |
| Germany-BMBF | KARLSRUHE-IEKP | Quast Gunter |
| Germany-BMBF | KARLSRUHE-IEKP | Rabbertz Klaus |
| Germany-BMBF | KARLSRUHE-IEKP | Schroder Matthias |
| Germany-BMBF | KARLSRUHE-IEKP | Shvetsov Ivan |
| Germany-BMBF | KARLSRUHE-IEKP | Simonis Hans Jurgen |
| Germany-BMBF | KARLSRUHE-IEKP | Ulrich Ralf Matthias |
| Germany-BMBF | KARLSRUHE-IEKP | Weber Marc |
| Germany-BMBF | KARLSRUHE-IEKP | Wolf Roger |
| Germany-DESY | DESY | Aldaya Martin Maria |
| Germany-DESY | DESY | Asawatangtrakuldee Chayanit |
| Germany-DESY | DESY | Beernaert Kelly Simone |
| Germany-DESY | DESY | Behnke Olaf |
| Germany-DESY | DESY | Behrens Ulf |
| Germany-DESY | DESY | Bertsche David Edwin |
| Germany-DESY | DESY | Borras Kerstin |
| Germany-DESY | DESY | Campbell Alan James |
| Germany-DESY | DESY | Contreras-Campana Christian Javier |
| Germany-DESY | DESY | Diez Carmen |
| Germany-DESY | DESY | Eckerlin Guenter |
| Germany-DESY | DESY | Eichhorn Thomas |
| Germany-DESY | DESY | Gallo Elisabetta |
| Germany-DESY | DESY | Geiser Achim |
| Germany-DESY | DESY | Grohsjean Alexander Josef |
| Germany-DESY | DESY | Gunnellini Paolo |
| Germany-DESY | DESY | Guthoff Moritz |
| Germany-DESY | DESY | Harb Ali |
| Germany-DESY | DESY | Jung Hannes |
| Germany-DESY | DESY | Kasemann Matthias |
| Germany-DESY | DESY | Keaveney James Michael |
| Germany-DESY | DESY | Kleinwort Claus |
| Germany-DESY | DESY | Kruecker Dirk Bernhard |
| Germany-DESY | DESY | Lange Wolfgang |
| Germany-DESY | DESY | Lenz Teresa |
| Germany-DESY | DESY | Lipka Ekaterina |
| Germany-DESY | DESY | Mankel Rainer |
| Germany-DESY | DESY | Melzer Pellmann Isabell Alissandra |
| Germany-DESY | DESY | Meyer Andreas Bernhard |
| Germany-DESY | DESY | Missiroli Marino |
| Germany-DESY | DESY | Mittag Gregor |
| Germany-DESY | DESY | Myronenko Volodymyr |
| Germany-DESY | DESY | Pitzl Daniel |
| Germany-DESY | DESY | Raspiareza Aliaksei |

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| Germany-DESY | DESY | Schwanenberger Christian |
| Germany-DESY | DESY | Turkot Oleksii |
| Germany-DESY | DESY | Van Onsem Gerrit Patrick |
| Germany-DESY | DESY | Walsh Bastos Rangel Roberval |
| Germany-DESY | DESY | Wichmann Katarzyna |
| Germany-DESY | DESY | Wissing Christoph |
| Germany-DESY | DESY | Zenaiev Oleksandr |
| Germany-DESY | DESY | Zlebcik Radek |
| Greece | ATHENS | Saoulidou Niki |
| Greece | ATHENS | Vellidis Konstantinos |
| Greece | ATHENS-NTUA | Kousouris Konstantinos |
| Greece | ATHENS-NTUA | Tsipolitis Georgios |
| Greece | DEMOKRITOS | Anagnostou Georgios |
| Greece | DEMOKRITOS | Daskalakis Georgios |
| Greece | DEMOKRITOS | Kyriakis Aristotelis |
| Greece | DEMOKRITOS | Loukas Demetrios |
| Greece | IOANNINA | Evangelou Ioannis |
| Greece | IOANNINA | Fountas Konstantinos |
| Greece | IOANNINA | Kokkas Panagiotis |
| Greece | IOANNINA | Manthos Nikolaos |
| Greece | IOANNINA | Papadopoulos Ioannis |
| Greece | IOANNINA | Strologas John |
| Hungary | ATOMKI | Molnar Jozsef |
| Hungary | ATOMKI | Szillasi Zoltan |
| Hungary | BUDAPEST | Hajdu Csaba |
| Hungary | BUDAPEST | Sikler Ferenc |
| Hungary | BUDAPEST | Veszpremi Viktor |
| Hungary | BUDAPEST-ELU | Csanad Mate |
| Hungary | BUDAPEST-ELU | Pasztor Gabriella |
| Hungary | BUDAPEST-ELU | Veres Gabor |
| Hungary | DEBRECEN-IEP | Trocsanyi Zoltan Laszlo |
| Hungary | DEBRECEN-IEP | Ujvari Balazs |
| India | BANGALORE-IISC | Choudhury Somnath |
| India | BANGALORE-IISC | Komaragiri Jyothsna Rani |
| India | CHANDIGARH | Bala Suman |
| India | CHANDIGARH | Bansal Sunil |
| India | CHANDIGARH | Bhatnagar Vipin |
| India | CHANDIGARH | Dhingra Nitish |
| India | CHANDIGARH | Lal Manjit Kaur |
| India | CHANDIGARH | Singh Jasbir |
| India | DELHI-UNIV | Bhardwaj Ashutosh |
| India | DELHI-UNIV | Chauhan Sushil Singh |

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| India | DELHI-UNIV | Choudhary Brajesh Chandra |
| India | DELHI-UNIV | Kumar Ashok |
| India | DELHI-UNIV | Naimuddin Md |
| India | DELHI-UNIV | Ranjan Kirti |
| India | IIT-MADRAS | Behera Prafulla |
| India | IIT-MADRAS | Pujahari Prabhat Ranjan |
| India | KOLKATA-SAHA | Bhattacharya Satyaki |
| India | KOLKATA-SAHA | Dutt Suneel |
| India | KOLKATA-SAHA | Dutta Suchandra |
| India | KOLKATA-SAHA | Sarkar Subir |
| India | KOLKATA-SAHA | Sharan Manoj Kumar |
| India | MUMBAI-BARC | Dutta Dipanwita |
| India | MUMBAI-BARC | Jha Vishwajeet |
| India | MUMBAI-BARC | Kumar Vineet |
| India | MUMBAI-BARC | Mishra Dipak |
| India | MUMBAI-BARC | Netrakanti Pawan Kumar |
| India | MUMBAI-BARC | Pant Lalit Mohan |
| India | MUMBAI-BARC | Shukla Prashant |
| India | NISER | Bahinipati Seema |
| India | NISER | Mal Prolay Kumar |
| India | NISER | Nayak Aruna Kumar |
| India | NISER | Swain Sanjay Kumar |
| India | PUNE-IISER | Dube Sourabh Shishir |
| India | PUNE-IISER | Sharma Seema |
| India | TIFR-A | Aziz Tariq |
| India | TIFR-A | Dugad Shashikant Raichand |
| India | TIFR-A | Mohanty Gagan Bihari |
| India | TIFR-B | Banerjee Sudeshna |
| India | TIFR-B | Guchait Monoranjan |
| India | TIFR-B | Jain Sandhya |
| India | TIFR-B | Maity Manas |
| India | TIFR-B | Majumder Gobinda |
| India | TIFR-B | Mazumdar Kajari |
| Iran | IPM | Etesami Seyed Mohsen |
| Iran | IPM | Khakzad Mohsen |
| Iran | IPM | Mohammadi Najafabadi Mojtaba |
| Iran | IPM | Safarzadeh Batool |
| Iran | IPM | Zeinali Maryam |
| Ireland | DUBLIN-UCD | Grunewald Martin |
| Italy | BARI | Abbrescia Marcello |
| Italy | BARI | Calabria Cesare |
| Italy | BARI | Colaleo Anna |

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| Italy | BARI | Creanza Donato |
| Italy | BARI | Cristella Leonardo |
| Italy | BARI | De Filippis Nicola |
| Italy | BARI | De Palma Mauro |
| Italy | BARI | Fiore Luigi |
| Italy | BARI | Iaselli Giuseppe |
| Italy | BARI | Maggi Marcello |
| Italy | BARI | Maggi Giorgio Pietro |
| Italy | BARI | My Salvatore |
| Italy | BARI | Nuzzo Salvatore |
| Italy | BARI | Pompili Alexis |
| Italy | BARI | Pugliese Gabriella |
| Italy | BARI | Radogna Raffaella |
| Italy | BARI | Ranieri Antonio |
| Italy | BARI | Sharma Archie |
| Italy | BARI | Silvestris Lucia |
| Italy | BARI | Venditti Rosamaria |
| Italy | BARI | Verwilligen Piet Omer J |
| Italy | BOLOGNA | Abbiendi Giovanni |
| Italy | BOLOGNA | Battilana Carlo |
| Italy | BOLOGNA | Bonacorsi Daniele |
| Italy | BOLOGNA | Braibant-Giacomelli Sylvie |
| Italy | BOLOGNA | Brigliadori Luca |
| Italy | BOLOGNA | Campanini Renato |
| Italy | BOLOGNA | Castro Andrea |
| Italy | BOLOGNA | Cavallo Francesca Romana |
| Italy | BOLOGNA | Chhibra Simranjit Singh |
| Italy | BOLOGNA | Ciocca Claudia |
| Italy | BOLOGNA | Cuffiani Marco |
| Italy | BOLOGNA | Dallavalle Gaetano-Marco |
| Italy | BOLOGNA | Fabbri Fabrizio |
| Italy | BOLOGNA | Fanfani Alessandra |
| Italy | BOLOGNA | Giacomelli Paolo |
| Italy | BOLOGNA | Guiducci Luigi |
| Italy | BOLOGNA | Lo Meo Sergio |
| Italy | BOLOGNA | Marcellini Stefano |
| Italy | BOLOGNA | Masetti Gianni |
| Italy | BOLOGNA | Perrotta Andrea |
| Italy | BOLOGNA | Rovelli Tiziano |
| Italy | BOLOGNA | Siroli Gian Piero |
| Italy | BOLOGNA | Tosi Nicolo |
| Italy | CATANIA | Di Mattia Sandro |
| Italy | CATANIA | Tricomi Alessia |

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| Italy | CATANIA | Tuve Cristina |
| Italy | FIRENZE | Barbagli Giuseppe |
| Italy | FIRENZE | Ciulli Vitaliano |
| Italy | FIRENZE | Civinini Carlo |
| Italy | FIRENZE | D'Alessandro Raffaello |
| Italy | FIRENZE | Focardi Ettore |
| Italy | FIRENZE | Latino Giuseppe |
| Italy | FIRENZE | Lenzi Piergiulio |
| Italy | FIRENZE | Meschini Marco |
| Italy | FIRENZE | Paoletti Simone |
| Italy | FIRENZE | Sguazzoni Giacomo |
| Italy | FIRENZE | Strom Derek |
| Italy | FIRENZE | Viliani Lorenzo |
| Italy | FRASCATI | Benussi Luigi |
| Italy | FRASCATI | Bianco Stefano |
| Italy | FRASCATI | Piccolo Davide |
| Italy | FRASCATI | Primavera Federica |
| Italy | GENOVA | Ferro Fabrizio |
| Italy | GENOVA | Robutti Enrico |
| Italy | GENOVA | Tosi Silvano |
| Italy | MILANO-BICOCCA | Benaglia Andrea |
| Italy | MILANO-BICOCCA | Dinardo Mauro |
| Italy | MILANO-BICOCCA | Fiorendi Sara |
| Italy | MILANO-BICOCCA | Gennai Simone |
| Italy | MILANO-BICOCCA | Ghezzi Alessio |
| Italy | MILANO-BICOCCA | Govoni Pietro |
| Italy | MILANO-BICOCCA | Malberti Martina |
| Italy | MILANO-BICOCCA | Malvezzi Sandra |
| Italy | MILANO-BICOCCA | Manzoni Riccardo Andrea |
| Italy | MILANO-BICOCCA | Menasce Dario |
| Italy | MILANO-BICOCCA | Paganoni Marco |
| Italy | MILANO-BICOCCA | Pedrini Daniele |
| Italy | MILANO-BICOCCA | Ragazzi Stefano |
| Italy | MILANO-BICOCCA | Redaelli Nicola |
| Italy | MILANO-BICOCCA | Tabarelli de Fatis Tommaso |
| Italy | NAPOLI | Buontempo Salvatore |
| Italy | NAPOLI | Cavallo Nicola |
| Italy | NAPOLI | Di Crescenzo Antonia |
| Italy | NAPOLI | Fabozzi Francesco |
| Italy | NAPOLI | Iorio Alberto Orso Maria |
| Italy | NAPOLI | Khan Wajid Ali |
| Italy | NAPOLI | Lista Luca |
| Italy | NAPOLI | Meola Sabino |

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| Italy | NAPOLI | Paolucci Pierluigi |
| Italy | PADOVA | Azzi Patrizia |
| Italy | PADOVA | Bacchetta Nicola |
| Italy | PADOVA | Benato Lisa |
| Italy | PADOVA | Boletti Alessio |
| Italy | PADOVA | Carlin Roberto |
| Italy | PADOVA | Checchia Paolo |
| Italy | PADOVA | Dall'Osso Martino |
| Italy | PADOVA | Dorigo Tommaso |
| Italy | PADOVA | Gasparini Ugo |
| Italy | PADOVA | Lacaprra Stefano |
| Italy | PADOVA | Lujan Paul Joseph |
| Italy | PADOVA | Margoni Martino |
| Italy | PADOVA | Meneguzzo Anna Teresa |
| Italy | PADOVA | Ronchese Paolo |
| Italy | PADOVA | Rossin Roberto |
| Italy | PADOVA | Simonetto Franco |
| Italy | PADOVA | Torassa Ezio |
| Italy | PADOVA | Zanetti Marco |
| Italy | PADOVA | Zotto Pierluigi |
| Italy | PAVIA | Braghieri Alessandro |
| Italy | PAVIA | Magnani Alice |
| Italy | PAVIA | Montagna Paolo |
| Italy | PAVIA | Re Valerio |
| Italy | PAVIA | Riccardi Cristina |
| Italy | PAVIA | Salvini Paola |
| Italy | PAVIA | Vai Ilaria |
| Italy | PAVIA | Vitulo Paolo |
| Italy | PERUGIA | Biasini Maurizio |
| Italy | PERUGIA | Bilei Gian Mario |
| Italy | PERUGIA | Cecchi Claudia |
| Italy | PERUGIA | Ciangottini Diego |
| Italy | PERUGIA | Fano' Livio |
| Italy | PERUGIA | Ionica Maria |
| Italy | PERUGIA | Manoni Elisa |
| Italy | PERUGIA | Menichelli Mauro |
| Italy | PERUGIA | Rossi Alessandro |
| Italy | PERUGIA | Santocchia Attilio |
| Italy | PERUGIA | Spiga Daniele |
| Italy | PISA | Androsov Konstantin |
| Italy | PISA | Azzurri Paolo |
| Italy | PISA | Bagliesi Giuseppe |
| Italy | PISA | Boccali Tommaso |

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| Italy | PISA | Borrello Laura |
| Italy | PISA | Ciocchi Agnese |
| Italy | PISA | Dell'Orso Roberto |
| Italy | PISA | Fedi Giacomo |
| Italy | PISA | Giassi Alessandro |
| Italy | PISA | Grippio Maria Teresa |
| Italy | PISA | Ligabue Franco |
| Italy | PISA | Messineo Alberto |
| Italy | PISA | Palla Fabrizio |
| Italy | PISA | Rizzi Andrea |
| Italy | PISA | Spagnolo Paolo |
| Italy | PISA | Tenchini Roberto |
| Italy | PISA | Tonelli Guido |
| Italy | PISA | Venturi Andrea |
| Italy | PISA | Verdini Piero |
| Italy | ROMA-1 | Barone Luciano |
| Italy | ROMA-1 | Cavallari Francesca |
| Italy | ROMA-1 | Daci Nadir |
| Italy | ROMA-1 | Del Re Daniele |
| Italy | ROMA-1 | Di Marco Emanuele |
| Italy | ROMA-1 | Diemoz Marcella |
| Italy | ROMA-1 | Longo Egidio |
| Italy | ROMA-1 | Marzocchi Badder |
| Italy | ROMA-1 | Meridiani Paolo |
| Italy | ROMA-1 | Organtini Giovanni |
| Italy | ROMA-1 | Paramatti Riccardo |
| Italy | ROMA-1 | Rahatlou Shahram |
| Italy | ROMA-1 | Rovelli Chiara Ilaria |
| Italy | ROMA-1 | Santanastasio Francesco |
| Italy | TORINO | Amapane Nicola Carlo |
| Italy | TORINO | Arcidiacono Roberta |
| Italy | TORINO | Argiro Stefano |
| Italy | TORINO | Arneodo Michele |
| Italy | TORINO | Bartosik Nazar |
| Italy | TORINO | Bellan Riccardo |
| Italy | TORINO | Biino Cristina |
| Italy | TORINO | Cartiglia Nicolo |
| Italy | TORINO | Costa Marco |
| Italy | TORINO | Covarelli Roberto |
| Italy | TORINO | Demaria Natale |
| Italy | TORINO | Mariotti Chiara |
| Italy | TORINO | Maselli Silvia |
| Italy | TORINO | Migliore Ernesto |

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| Italy | TORINO | Monteno Marco |
| Italy | TORINO | Obertino Margherita Maria |
| Italy | TORINO | Pacher Luca |
| Italy | TORINO | Pastrone Nadia |
| Italy | TORINO | Pelliccioni Mario |
| Italy | TORINO | Ruspa Marta |
| Italy | TORINO | Sola Valentina |
| Italy | TORINO | Solano Ada Maria |
| Italy | TORINO | Staiano Amedeo |
| Italy | TORINO | Traczyk Piotr |
| Italy | TRIESTE | Belforte Stefano |
| Italy | TRIESTE | Casarsa Massimo |
| Italy | TRIESTE | Cossutti Fabio |
| Italy | TRIESTE | Della Ricca Giuseppe |
| Italy | TRIESTE | Zanetti Anna Maria |
| Korea | CHONNAM | Kim Hyunchul |
| Korea | CHONNAM | Moon Dong Ho |
| Korea | KOREA-UNIV | Choi Su Yong |
| Korea | KOREA-UNIV | Hong Byungsik |
| Korea | KOREA-UNIV | Lee Kyong Sei |
| Korea | KOREA-UNIV | Park Sung Keun |
| Korea | KOREA-UNIV | Roh Youn |
| Korea | KYUNGPOOK | Kim Gui Nyun |
| Korea | KYUNGPOOK | Kim Min Suk |
| Korea | KYUNGPOOK | Kim Dong Hee |
| Korea | KYUNGPOOK | Lee Seh Wook |
| Korea | KYUNGPOOK | Lee Sang Eun |
| Korea | KYUNGPOOK | Moon Chang-Seong |
| Korea | KYUNGPOOK | Oh Young Do |
| Korea | KYUNGPOOK | Sekmen Sezen |
| Korea | KYUNGPOOK | Yang Yu Chul |
| Korea | SEOUL-HANYANG | Goh Junghwan |
| Korea | SEOUL-HANYANG | Kim Tae Jeong |
| Korea | SEOUL-SEJONG | Kim Hyunsoo |
| Korea | SEOUL-SNU | Almond John Leslie |
| Korea | SEOUL-SNU | Radburn-smith Benjamin Charles |
| Korea | SEOUL-SNU | Seo Seon Hee |
| Korea | SEOUL-SNU | Yang Un Ki |
| Korea | SEOUL-SNU | Yoo Hwidong |
| Korea | SEOUL-SNU | Yoon Inseok |
| Korea | SEOUL-SNU | Yu Geum Bong |
| Korea | SEOUL-UNIV | Kim Ji Hyun |
| Korea | SEOUL-UNIV | Lee Jason |

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| Korea | SEOUL-UNIV | Park Inkyu |
| Korea | SKK-UNIV | Choi Young-Il |
| Korea | SKK-UNIV | Lee Jongseok |
| Korea | SKK-UNIV | Yu Intae |
| Lithuania | VILNIUS-UNIV | Juodagalvis Andrius |
| Lithuania | VILNIUS-UNIV | Vaitkus Juozas |
| Malaysia | MALAYA | Ibrahim Zainol Abidin Bin |
| Malaysia | MALAYA | Mohamad Idris Faridah Binti |
| Malaysia | MALAYA | Wan Abdullah Wan Ahmad Tajuddin |
| Mexico | MEXICO-CINVESTAV | Castilla-Valdez Heriberto |
| Mexico | MEXICO-CINVESTAV | De La Cruz-Burelo Eduard |
| Mexico | MEXICO-CINVESTAV | Heredia De La Cruz Ivan |
| Mexico | MEXICO-CINVESTAV | Lopez-Fernandez Ricardo |
| Mexico | MEXICO-CINVESTAV | Murillo Quijada Javier Alberto |
| Mexico | MEXICO-CINVESTAV | Sanchez Hernandez Alberto |
| Mexico | MEXICO-IBEROAM | Carrillo Salvador |
| Mexico | MEXICO-IBEROAM | Oropeza Barrera Cristina |
| Mexico | MEXICO-IBEROAM | Vazquez Valencia Elsa Fabiola |
| Mexico | MEXICO-PUEBLA | Pedraza Morales Maria Isabel |
| Mexico | MEXICO-PUEBLA | Salazar Ibarquen Humberto Antonio |
| Mexico | MEXICO-PUEBLA | Uribe Estrada Cecilia |
| Mexico | MEXICO-UASLP | Morelos Pineda Antonio |
| New Zealand | AUCKLAND | Krofcheck David |
| New Zealand | CANTERBURY | Butler Philip |
| Pakistan | ISLAMABAD-NCP | Ahmad Ashfaq |
| Pakistan | ISLAMABAD-NCP | Asghar Muhammad Irfan |
| Pakistan | ISLAMABAD-NCP | Hoorani Hafeez R. |
| Poland | WARSAW-IEP | Bunkowski Karol |
| Poland | WARSAW-IEP | Doroba Krzysztof |
| Poland | WARSAW-IEP | Kalinowski Artur |
| Poland | WARSAW-IEP | Konecki Marcin Andrzej |
| Poland | WARSAW-IEP | Krolkowski Jan |
| Poland | WARSAW-INS | Bialkowska Helena |
| Poland | WARSAW-INS | Bluj Michal Jacek |
| Poland | WARSAW-INS | Boimska Bozena |
| Poland | WARSAW-INS | Frueboes Tomasz |
| Poland | WARSAW-INS | Gorski Maciej |
| Poland | WARSAW-INS | Kazana Malgorzata |
| Poland | WARSAW-INS | Nawrocki Krzysztof |
| Poland | WARSAW-INS | Szleper Michal |
| Poland | WARSAW-INS | Zalewski Piotr |
| Portugal | LIP | Bargassa Pedrame |

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| Portugal | LIP | Beirao Da Cruz E Silva Cristovao |
| Portugal | LIP | Faccioli Pietro |
| Portugal | LIP | Gallinaro Michele |
| Portugal | LIP | Hollar Jonathan |
| Portugal | LIP | Seixas Joao Carlos |
| Portugal | LIP | Varela Joao |
| Portugal | LIP | Viegas Guerreiro Leonardo Nuno Teotonio |
| RDMS-DMS-JINR | YEREVAN | Sirunyan Albert |
| RDMS-DMS-JINR | YEREVAN | Tumasyan Armen |
| RDMS-DMS-JINR | MINSK-INP | Mossolov Vladimir |
| RDMS-DMS-JINR | MINSK-INP | Suarez Gonzalez Juan |
| RDMS-DMS-JINR | MINSK-INP | Tchekhovski Vladimir |
| RDMS-DMS-JINR | CHARLES-UNIV | Finger Michael |
| RDMS-DMS-JINR | CHARLES-UNIV | Finger Miroslav |
| RDMS-DMS-JINR | TBILISI-TSU | Tsamalaidze Zviad |
| RDMS-DMS-JINR | DUBNA | Afanasiev Sergey |
| RDMS-DMS-JINR | DUBNA | Gorbunov Ilya |
| RDMS-DMS-JINR | DUBNA | Karjavine Vladimir |
| RDMS-DMS-JINR | DUBNA | Lanev Alexander |
| RDMS-DMS-JINR | DUBNA | Malakhov Alexander |
| RDMS-DMS-JINR | DUBNA | Matveev Victor |
| RDMS-DMS-JINR | DUBNA | Pal'Chik Vladimir |
| RDMS-DMS-JINR | DUBNA | Perelygin Victor |
| RDMS-DMS-JINR | DUBNA | Shmatov Sergey |
| RDMS-DMS-JINR | DUBNA | Shulha Siarhei |
| RDMS-DMS-JINR | DUBNA | Skachkov Nikolay |
| RDMS-DMS-JINR | DUBNA | Smirnov Vitaly |
| RDMS-DMS-JINR | DUBNA | Zarubin Anatoly |
| RDMS-DMS-JINR | KHARKOV-ISMA | Grynyov Borys |
| RDMS-DMS-JINR | KHARKOV-KIPT | Levchuk Leonid |
| RDMS-Russia-MES | MEPHI | Chistov Ruslan |
| RDMS-Russia-MES | MEPHI | Markin Oleg |
| RDMS-Russia-MES | MEPHI | Pakhlov Pavel |
| RDMS-Russia-MES | MEPHI | Popova Elena |
| RDMS-Russia-MES | MEPHI | Tarkovskiy Evgueni |
| RDMS-Russia-MES | MEPHI | Vinogradov Sergey |
| RDMS-Russia-MES | MOSCOW-INR | Andreev Yuri |
| RDMS-Russia-MES | MOSCOW-INR | Dermenev Alexander |
| RDMS-Russia-MES | MOSCOW-INR | Gninenko Sergei |
| RDMS-Russia-MES | MOSCOW-INR | Golubev Nikolai |
| RDMS-Russia-MES | MOSCOW-INR | Karneyeu Anton |
| RDMS-Russia-MES | MOSCOW-INR | Kirsanov Mikhail |

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| RDMS-Russia-MES | MOSCOW-INR | Krasnikov Nikolay |
| RDMS-Russia-MES | MOSCOW-INR | Pashenkov Anatoli |
| RDMS-Russia-MES | MOSCOW-INR | Shabanov Arseniy |
| RDMS-Russia-MES | MOSCOW-INR | Tlisov Danila |
| RDMS-Russia-MES | MOSCOW-INR | Toropin Alexander |
| RDMS-Russia-MES | MOSCOW-ITEP | Epshteyn Vladimir |
| RDMS-Russia-MES | MOSCOW-ITEP | Gavrilov Vladimir |
| RDMS-Russia-MES | MOSCOW-ITEP | Lychkovskaya Natalia |
| RDMS-Russia-MES | MOSCOW-ITEP | Popov Vladimir |
| RDMS-Russia-MES | MOSCOW-ITEP | Safronov Grigory |
| RDMS-Russia-MES | MOSCOW-ITEP | Spiridonov Alexandre |
| RDMS-Russia-MES | MOSCOW-ITEP | Vlassov Evgueni |
| RDMS-Russia-MES | MOSCOW-ITEP | Zhokin Alexander |
| RDMS-Russia-MES | MOSCOW-LEBEDEV | Andreev Vladimir |
| RDMS-Russia-MES | MOSCOW-LEBEDEV | Azarkin Maksim |
| RDMS-Russia-MES | MOSCOW-LEBEDEV | Dremmin Igor |
| RDMS-Russia-MES | MOSCOW-LEBEDEV | Kirakosyan Martin |
| RDMS-Russia-MES | MOSCOW-LEBEDEV | Terkulov Adel |
| RDMS-Russia-MES | MOSCOW-MIPT | Aushev Tagir |
| RDMS-Russia-MES | MOSCOW-MIPT | Bylinkin Alexandr |
| RDMS-Russia-MES | MOSCOW-MSU | Boos Eduard |
| RDMS-Russia-MES | MOSCOW-MSU | Dubinina Mikhail |
| RDMS-Russia-MES | MOSCOW-MSU | Dudko Lev |
| RDMS-Russia-MES | MOSCOW-MSU | Ershov Alexander |
| RDMS-Russia-MES | MOSCOW-MSU | Gribushin Andrey |
| RDMS-Russia-MES | MOSCOW-MSU | Klyukhin Vyacheslav |
| RDMS-Russia-MES | MOSCOW-MSU | Kodolova Olga |
| RDMS-Russia-MES | MOSCOW-MSU | Lokhtin Igor |
| RDMS-Russia-MES | MOSCOW-MSU | Petrushanko Sergey |
| RDMS-Russia-MES | MOSCOW-MSU | Savrin Victor |
| RDMS-Russia-MES | MOSCOW-MSU | Snigirev Alexander |
| RDMS-Russia-MES | NOVOSIBIRSK-NSU | Blinov Vladimir |
| RDMS-Russia-MES | NOVOSIBIRSK-NSU | Dimova Tatyana |
| RDMS-Russia-MES | NOVOSIBIRSK-NSU | Shtol Dmitry |
| RDMS-Russia-MES | NOVOSIBIRSK-NSU | Skovpen Iurii |
| RDMS-Russia-MES | PROTVINO | Azhgirey Igor |
| RDMS-Russia-MES | PROTVINO | Bayshev Igor |
| RDMS-Russia-MES | PROTVINO | Bitjukov Sergey |
| RDMS-Russia-MES | PROTVINO | Elumakhov Dmitry |
| RDMS-Russia-MES | PROTVINO | Kachanov Vasily |
| RDMS-Russia-MES | PROTVINO | Kalinin Alexey |
| RDMS-Russia-MES | PROTVINO | Konstantinov Dmitry |
| RDMS-Russia-MES | PROTVINO | Petrov Vladimir |

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| RDMS-Russia-MES | PROTVINO | Ryutin Roman |
| RDMS-Russia-MES | PROTVINO | Slabospitskii Sergei |
| RDMS-Russia-MES | PROTVINO | Sobol Andrey |
| RDMS-Russia-MES | PROTVINO | Troshin Sergey |
| RDMS-Russia-MES | PROTVINO | Tyurin Nikolay |
| RDMS-Russia-MES | PROTVINO | Uzunyan Andrey |
| RDMS-Russia-MES | PROTVINO | Volkov Alexey |
| RDMS-Russia-MES | ST-PETERSBURG | Golovtsov Victor |
| RDMS-Russia-MES | ST-PETERSBURG | Ivanov Yury |
| RDMS-Russia-MES | ST-PETERSBURG | Kim Victor |
| RDMS-Russia-MES | ST-PETERSBURG | Kuznetsova Ekaterina |
| RDMS-Russia-MES | ST-PETERSBURG | Levchenko Petr |
| RDMS-Russia-MES | ST-PETERSBURG | Smirnov Igor |
| RDMS-Russia-MES | ST-PETERSBURG | Sulimov Valentin |
| RDMS-Russia-MES | ST-PETERSBURG | Uvarov Lev |
| RDMS-Russia-MES | ST-PETERSBURG | Vavilov Sergey |
| RDMS-Russia-MES | ST-PETERSBURG | Vorobyev Alexey |
| RDMS-Russia-MES | TOMSK-POLYTEC | Babaev Anton |
| RDMS-Russia-MES | TOMSK-POLYTEC | Baidali Sergei |
| Serbia | VINCA | Adzic Petar |
| Serbia | VINCA | Dordevic Milos |
| Serbia | VINCA | Milosevic Jovan |
| Spain | MADRID-CIEMAT | Alcaraz Maestre Juan |
| Spain | MADRID-CIEMAT | Cerrada Marcos |
| Spain | MADRID-CIEMAT | Colino Nicanor |
| Spain | MADRID-CIEMAT | De La Cruz Begona |
| Spain | MADRID-CIEMAT | Delgado Peris Antonio |
| Spain | MADRID-CIEMAT | Fernandez Bedoya Cristina |
| Spain | MADRID-CIEMAT | Fernandez Ramos Juan Pablo |
| Spain | MADRID-CIEMAT | Flix Molina Jose |
| Spain | MADRID-CIEMAT | Fouz Iglesias Maria |
| Spain | MADRID-CIEMAT | Gonzalez Lopez Oscar |
| Spain | MADRID-CIEMAT | Goy Lopez Silvia |
| Spain | MADRID-CIEMAT | Hernandez Calama Jose |
| Spain | MADRID-CIEMAT | Josa Mutuberrria Maria Isabel |
| Spain | MADRID-CIEMAT | Moran Dermot Anthony |
| Spain | MADRID-CIEMAT | Perez-Calero Yzquierdo Antonio Maria |
| Spain | MADRID-CIEMAT | Puerta Pelayo Jesus |
| Spain | MADRID-CIEMAT | Redondo Fernandez Ignacio |
| Spain | MADRID-CIEMAT | Romero Luciano |
| Spain | MADRID-CIEMAT | Senghi Soares Mara |
| Spain | MADRID-CIEMAT | Triossi Andrea |

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| Spain | MADRID-UNIV | Fernandez De Troconiz Jorge |
| Spain | OVIEDO | Cuevas Maestro Javier |
| Spain | OVIEDO | Fernandez Menendez Javier |
| Spain | OVIEDO | Gonzalez Caballero Isidro |
| Spain | OVIEDO | Palencia Cortezon Jose Enrique |
| Spain | OVIEDO | Vischia Pietro |
| Spain | OVIEDO | Vizan Garcia Jesus Manuel |
| Spain | SANTANDER | Calderon Tazon Alicia |
| Spain | SANTANDER | Duarte Campderros Jordi |
| Spain | SANTANDER | Fernandez Garcia Marcos |
| Spain | SANTANDER | Gomez Gervasio |
| Spain | SANTANDER | Lopez Virto Amparo |
| Spain | SANTANDER | Marco Jesus |
| Spain | SANTANDER | Martinez Rivero Celso |
| Spain | SANTANDER | Martinez Ruiz del Arbol Pablo |
| Spain | SANTANDER | Matorras Francisco |
| Spain | SANTANDER | Piedra Gomez Jonatan |
| Spain | SANTANDER | Rodrigo Teresa |
| Spain | SANTANDER | Ruiz Jimeno Alberto |
| Spain | SANTANDER | Scodellaro Luca |
| Spain | SANTANDER | Vila Alvarez Ivan |
| Spain | SANTANDER | Vilar Cortabitarte Rocio |
| Switzerland ETHZ | ZURICH-ETH | Backhaus Malte |
| Switzerland ETHZ | ZURICH-ETH | Dissertori Gunther |
| Switzerland ETHZ | ZURICH-ETH | Dittmar Michael |
| Switzerland ETHZ | ZURICH-ETH | Donega Mauro |
| Switzerland ETHZ | ZURICH-ETH | Grab Christophorus |
| Switzerland ETHZ | ZURICH-ETH | Hits Dmitry |
| Switzerland ETHZ | ZURICH-ETH | Lustermann Werner |
| Switzerland ETHZ | ZURICH-ETH | Marionneau Matthieu |
| Switzerland ETHZ | ZURICH-ETH | Micheli Francesco |
| Switzerland ETHZ | ZURICH-ETH | Musella Pasquale |
| Switzerland ETHZ | ZURICH-ETH | Nessi-Tedaldi Francesca |
| Switzerland ETHZ | ZURICH-ETH | Perrozzi Luca |
| Switzerland ETHZ | ZURICH-ETH | Shchutska Lesya |
| Switzerland ETHZ | ZURICH-ETH | Theofilatos Konstantinos |
| Switzerland ETHZ | ZURICH-ETH | Wallny Rainer |
| Switzerland PSI | PSI | Caminada Lea Michaela |
| Switzerland PSI | PSI | Erdmann Wolfram |
| Switzerland PSI | PSI | Kaestli Hans Christian |
| Switzerland PSI | PSI | Kotlinski Bohdan |
| Switzerland PSI | PSI | Langenegger Urs |

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| Switzerland PSI | PSI | Rohe Tilman Volker |
| Switzerland University | ZURICH-UNIV | Canelli Florencia Maria |
| Switzerland University | ZURICH-UNIV | De Cosa Annapaola |
| Switzerland University | ZURICH-UNIV | Donato Silvio |
| Switzerland University | ZURICH-UNIV | Hreus Tomas |
| Switzerland University | ZURICH-UNIV | Kilminster Benjamin John |
| Switzerland University | ZURICH-UNIV | Robmann Peter Willy |
| Switzerland University | ZURICH-UNIV | Seitz Claudia |
| Switzerland University | ZURICH-UNIV | Takahashi Yuta |
| Switzerland University | ZURICH-UNIV | Zucchetta Alberto |
| Taipei | CHUNGLI-NCU | Candelise Vieri |
| Taipei | CHUNGLI-NCU | Jain Shilpi |
| Taipei | CHUNGLI-NCU | Khurana Raman |
| Taipei | CHUNGLI-NCU | Kuo Chia-Ming |
| Taipei | CHUNGLI-NCU | Lin Willis Tsung-Tai |
| Taipei | CHUNGLI-NCU | Pozdnyakov Andrey |
| Taipei | CHUNGLI-NCU | Yu Shin-Shan |
| Taipei | TAIPEI-NTU | Chang Pao-Ti |
| Taipei | TAIPEI-NTU | Chao Yuan |
| Taipei | TAIPEI-NTU | Chen Kai-Feng |
| Taipei | TAIPEI-NTU | Hou George Wei-Shu |
| Taipei | TAIPEI-NTU | Kumar Arun |
| Taipei | TAIPEI-NTU | Lu Rong-Shyang |
| Taipei | TAIPEI-NTU | Paganis Efstathios |
| Taipei | TAIPEI-NTU | Psallidas Andreas |
| Taipei | TAIPEI-NTU | Steen Arnaud |
| Thailand | BANGKOK | Asavapibhop Burin |
| Thailand | BANGKOK | Srimanobhas Norraphat |
| Thailand | BANGKOK | Suwonjandee Narumon |
| Turkey | ADANA-CUKUROVA | Dumanoglu Isa |
| Turkey | ADANA-CUKUROVA | Eskut Eda |
| Turkey | ADANA-CUKUROVA | Ozturk Sertac |
| Turkey | ADANA-CUKUROVA | Polatoz Ayse |
| Turkey | ANKARA-METU | Gamsizkan Halil |
| Turkey | ANKARA-METU | Guler Ali Murat |
| Turkey | ANKARA-METU | Isildak Bora |
| Turkey | ANKARA-METU | Serin Meltem |
| Turkey | BOGAZICI | Ozkorucuklu Suat |
| Turkey | BOGAZICI | Yetkin Elif Asli |
| Turkey | ISTANBUL-TECH | Cakir Muammer Altan |
| Turkey | ISTANBUL-TECH | Sen Sercan |
| United Kingdom | BRISTOL | Brooke James John |

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| United Kingdom | BRISTOL | Clement Emyr John |
| United Kingdom | BRISTOL | Cussans David |
| United Kingdom | BRISTOL | Davignon Olivier |
| United Kingdom | BRISTOL | Flacher Henning Ulrik |
| United Kingdom | BRISTOL | Goldstein Joel |
| United Kingdom | BRISTOL | Heath Helen Frances |
| United Kingdom | BRISTOL | Kreczko Lukasz |
| United Kingdom | BRISTOL | Krikler Benjamin |
| United Kingdom | BRISTOL | Newbold David |
| United Kingdom | BRISTOL | Paramesvaran Sudarshan |
| United Kingdom | BRISTOL | Penning Bjorn |
| United Kingdom | BRISTOL | Sakuma Tai |
| United Kingdom | BRUNEL | Cole Joanne |
| United Kingdom | BRUNEL | Hobson Peter |
| United Kingdom | BRUNEL | Khan Akram |
| United Kingdom | BRUNEL | Kyberd Paul |
| United Kingdom | BRUNEL | Mackay Catherine Kirsty |
| United Kingdom | BRUNEL | Reid Ivan |
| United Kingdom | BRUNEL | Teodorescu Liliana |
| United Kingdom | LONDON-IC | Auzinger Georg |
| United Kingdom | LONDON-IC | Bainbridge Robert |
| United Kingdom | LONDON-IC | Bloch Philippe |
| United Kingdom | LONDON-IC | Borg Johan |
| United Kingdom | LONDON-IC | Buchmuller Oliver |
| United Kingdom | LONDON-IC | Bundock Aaron |
| United Kingdom | LONDON-IC | Colling David |
| United Kingdom | LONDON-IC | Dauncey Paul Dominic |
| United Kingdom | LONDON-IC | Davies Gavin John |
| United Kingdom | LONDON-IC | Haddad Yacine |
| United Kingdom | LONDON-IC | Iles Gregory Michiel |
| United Kingdom | LONDON-IC | Magnan Anne-marie |
| United Kingdom | LONDON-IC | Malik Sarah Alam |
| United Kingdom | LONDON-IC | Mastrolorenzo Luca |
| United Kingdom | LONDON-IC | Nash Jordan |
| United Kingdom | LONDON-IC | Nikitenko Alexander |
| United Kingdom | LONDON-IC | Palladino Vito |
| United Kingdom | LONDON-IC | Pesaresi Mark Franco |
| United Kingdom | LONDON-IC | Richards Alexander John |
| United Kingdom | LONDON-IC | Rose Andrew |
| United Kingdom | LONDON-IC | Tapper Alexander |
| United Kingdom | LONDON-IC | Uchida Kirika |
| United Kingdom | LONDON-IC | Virdee Tejinder |
| United Kingdom | LONDON-IC | Wardle Nicholas |

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| United Kingdom | LONDON-IC | Zenz Seth |
| United Kingdom | RAL | Belyaev Alexander |
| United Kingdom | RAL | Brew Christopher |
| United Kingdom | RAL | Cockerill David |
| United Kingdom | RAL | Coughlan John Anthony |
| United Kingdom | RAL | Harder Kristian |
| United Kingdom | RAL | Harper Sam |
| United Kingdom | RAL | Linacre Jacob Thomas |
| United Kingdom | RAL | Manolopoulos Konstantinos |
| United Kingdom | RAL | Olaiya Emmanuel Olatunji |
| United Kingdom | RAL | Petyt David Anthony |
| United Kingdom | RAL | Shepherd-Themistocleous Claire |
| United Kingdom | RAL | Thea Alessandro |
| United Kingdom | RAL | Tomalin Ian |
| United Kingdom | RAL | Williams Thomas Stephen |
| USA-DOE | BAYLOR-UNIV | Dittmann Jay Richard |
| USA-DOE | BAYLOR-UNIV | Hatakeyama Kenichi |
| USA-DOE | BAYLOR-UNIV | Liu Hongxuan |
| USA-DOE | BAYLOR-UNIV | Pastika Nathaniel Joseph |
| USA-DOE | BOSTON-UNIV | Bose Tulika |
| USA-DOE | BOSTON-UNIV | Gastler Daniel Edward |
| USA-DOE | BOSTON-UNIV | Rohlf James |
| USA-DOE | BOSTON-UNIV | Sulak Lawrence |
| USA-DOE | BROWN-UNIV | Benelli Gabriele |
| USA-DOE | BROWN-UNIV | Heintz Ulrich |
| USA-DOE | BROWN-UNIV | Hogan Julie Managan |
| USA-DOE | BROWN-UNIV | Korotkov Andrei Lenoktovich |
| USA-DOE | BROWN-UNIV | Laird Edward |
| USA-DOE | BROWN-UNIV | Landsberg Greg |
| USA-DOE | BROWN-UNIV | Narain Meenakshi |
| USA-DOE | BROWN-UNIV | Pazzini Jacopo |
| USA-DOE | BROWN-UNIV | Piperov Stefan |
| USA-DOE | BROWN-UNIV | Yu David Ren-hwa |
| USA-DOE | CALTECH | Bornheim Adolf |
| USA-DOE | CALTECH | Lu Nan |
| USA-DOE | CALTECH | Newman Harvey |
| USA-DOE | CALTECH | Spiropulu Maria |
| USA-DOE | CALTECH | Vlimant Jean-Roch |
| USA-DOE | CALTECH | Xie Si |
| USA-DOE | CALTECH | Zhu Ren-Yuan |
| USA-DOE | CARNEGIE-MELLON | Paulini Manfred |
| USA-DOE | CARNEGIE-MELLON | Vorobiev Igor |
| USA-DOE | CARNEGIE-MELLON | Weinberg Marc Gabriel |

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| USA-DOE | COLORADO | Cumalat John Perry |
| USA-DOE | COLORADO | Leontsinis Stefanos |
| USA-DOE | COLORADO | Stenson Kevin Matthew |
| USA-DOE | COLORADO | Wagner Stephen Robert |
| USA-DOE | FERMILAB | Abdoulline Salavat |
| USA-DOE | FERMILAB | Alyari Maral Fereydoun |
| USA-DOE | FERMILAB | Apollinari Giorgio |
| USA-DOE | FERMILAB | Apresyan Artur |
| USA-DOE | FERMILAB | Apyan Aram |
| USA-DOE | FERMILAB | Banerjee Sunanda |
| USA-DOE | FERMILAB | Bauerdick Lothar |
| USA-DOE | FERMILAB | Berryhill Jeffrey |
| USA-DOE | FERMILAB | Bhat Pushpalatha |
| USA-DOE | FERMILAB | Burkett Kevin A |
| USA-DOE | FERMILAB | Butler Joel Nathan |
| USA-DOE | FERMILAB | Canepa Anadi |
| USA-DOE | FERMILAB | Cerati Giuseppe Benedetto |
| USA-DOE | FERMILAB | Cheung Harry |
| USA-DOE | FERMILAB | Chlebana Frank |
| USA-DOE | FERMILAB | Cremonesi Matteo |
| USA-DOE | FERMILAB | Duarte Javier Mauricio |
| USA-DOE | FERMILAB | Elvira Victor Daniel |
| USA-DOE | FERMILAB | Freeman James |
| USA-DOE | FERMILAB | Gecse Zoltan |
| USA-DOE | FERMILAB | Gottschalk Erik |
| USA-DOE | FERMILAB | Gray Lindsey Andrew |
| USA-DOE | FERMILAB | Gruenendahl Stefan |
| USA-DOE | FERMILAB | Gutsche Oliver |
| USA-DOE | FERMILAB | Harris Robert |
| USA-DOE | FERMILAB | Hasegawa Satoshi |
| USA-DOE | FERMILAB | Hirschauer James Francis |
| USA-DOE | FERMILAB | Hu Zhen |
| USA-DOE | FERMILAB | Jayatilaka Bo |
| USA-DOE | FERMILAB | Jindariani Sergo |
| USA-DOE | FERMILAB | Joshi Umeshwar |
| USA-DOE | FERMILAB | Klima Boaz |
| USA-DOE | FERMILAB | Kreis Benjamin Jonah |
| USA-DOE | FERMILAB | Lammel Stephan |
| USA-DOE | FERMILAB | Lincoln Donald William |
| USA-DOE | FERMILAB | Lipton Ron |
| USA-DOE | FERMILAB | Liu Tiehui Ted |
| USA-DOE | FERMILAB | Liu Miaoyuan |
| USA-DOE | FERMILAB | Lykken Joseph |

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| USA-DOE | FERMILAB | Maeshima Kaori |
| USA-DOE | FERMILAB | Mason David Alexander |
| USA-DOE | FERMILAB | McBride Patricia |
| USA-DOE | FERMILAB | Merkel Petra |
| USA-DOE | FERMILAB | Mrenna Stephen |
| USA-DOE | FERMILAB | Nahn Steven Christopher |
| USA-DOE | FERMILAB | O'Dell Vivian |
| USA-DOE | FERMILAB | Pedro Kevin Jerome |
| USA-DOE | FERMILAB | Prokofyev Oleg |
| USA-DOE | FERMILAB | Rakness Gregory Leif |
| USA-DOE | FERMILAB | Ristori Luciano |
| USA-DOE | FERMILAB | Schneider Basil |
| USA-DOE | FERMILAB | Sexton-Kennedy Elizabeth |
| USA-DOE | FERMILAB | Soha Aron |
| USA-DOE | FERMILAB | Spalding William Jeffrey |
| USA-DOE | FERMILAB | Spiegel Leonard |
| USA-DOE | FERMILAB | Stoynev Stoyan Emilov |
| USA-DOE | FERMILAB | Strait Jim |
| USA-DOE | FERMILAB | Strobbe Nadja Catharina |
| USA-DOE | FERMILAB | Taylor Lucas |
| USA-DOE | FERMILAB | Tkaczyk Slawomir |
| USA-DOE | FERMILAB | Tran Nhan |
| USA-DOE | FERMILAB | Uplegger Lorenzo |
| USA-DOE | FERMILAB | Vaandering Eric Wayne |
| USA-DOE | FERMILAB | Vernieri Caterina |
| USA-DOE | FERMILAB | Verzocchi Marco |
| USA-DOE | FERMILAB | Wang Michael |
| USA-DOE | FERMILAB | Weber Hannsjorg Artur |
| USA-DOE | FERMILAB | Whitbeck Andrew James |
| USA-DOE | FLORIDA-STATE | Adams Todd |
| USA-DOE | FLORIDA-STATE | Askew Andrew |
| USA-DOE | FLORIDA-STATE | Johnson Kurtis |
| USA-DOE | FLORIDA-STATE | Kolberg Ted |
| USA-DOE | FLORIDA-STATE | Martinez German Ruben |
| USA-DOE | FLORIDA-STATE | Perry Thomas Mastrianni |
| USA-DOE | FLORIDA-STATE | Prosper Harrison |
| USA-DOE | FLORIDA-STATE | Saha Anirban |
| USA-DOE | FLORIDA-STATE | Sharma Varun |
| USA-DOE | FLORIDA-STATE | Yohay Rachel Paula |
| USA-DOE | FLORIDA-TECH | Colafranceschi Stefano |
| USA-DOE | FLORIDA-TECH | Hohlmann Marcus |
| USA-DOE | FLORIDA-TECH | Noonan Daniel Christopher |
| USA-DOE | FLORIDA-TECH | Yumiceva Francisco |

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| USA-DOE | FLORIDA-UNIV | Acosta Darin Edward |
| USA-DOE | FLORIDA-UNIV | Avery Paul Ralph |
| USA-DOE | FLORIDA-UNIV | Bortignon Pierluigi |
| USA-DOE | FLORIDA-UNIV | Brinkerhoff Andrew Wilson |
| USA-DOE | FLORIDA-UNIV | Gleyzer Sergei |
| USA-DOE | FLORIDA-UNIV | Konigsberg Jacobo |
| USA-DOE | FLORIDA-UNIV | Korytov Andrei |
| USA-DOE | FLORIDA-UNIV | Matchev Konstantin |
| USA-DOE | FLORIDA-UNIV | Mitselmakher Guenakh |
| USA-DOE | FLORIDA-UNIV | Sperka David Michael |
| USA-DOE | FLORIDA-UNIV | Thomas Laurent |
| USA-DOE | FLORIDA-UNIV | Wang Jian |
| USA-DOE | IOWA | Merlo Jean-Pierre |
| USA-DOE | IOWA | Mestvirishvili Alexi |
| USA-DOE | IOWA | Nachtman Jane |
| USA-DOE | IOWA | Onel Yasar |
| USA-DOE | KANSAS-STATE | Ivanov Andrey |
| USA-DOE | KANSAS-STATE | Kaadze Ketino |
| USA-DOE | KANSAS-STATE | Maravin Yurii |
| USA-DOE | KANSAS-STATE | Mohammadi Abdollah |
| USA-DOE | MARYLAND | Baden Andrew |
| USA-DOE | MARYLAND | Belloni Alberto |
| USA-DOE | MARYLAND | Eno Sarah Catherine |
| USA-DOE | MARYLAND | Hadley Nicholas John |
| USA-DOE | MARYLAND | Jabeen Shabnam |
| USA-DOE | MARYLAND | Jeng Geng-Yuan |
| USA-DOE | MARYLAND | Kunkle Joshua Milo |
| USA-DOE | MARYLAND | Ricci-Tam Francesca |
| USA-DOE | MARYLAND | Skuja Andris |
| USA-DOE | MINNESOTA | Chatterjee Rajdeep Mohan |
| USA-DOE | MINNESOTA | Kubota Yuichi |
| USA-DOE | MINNESOTA | Mans Jeremiah Michael |
| USA-DOE | MINNESOTA | Nourbakhsh Shervin |
| USA-DOE | MINNESOTA | Rusack Roger |
| USA-DOE | MIT | Azzolini Virginia |
| USA-DOE | MIT | D'Alfonso Mariarosaria |
| USA-DOE | MIT | Demiragli Zeynep |
| USA-DOE | MIT | Gomez Ceballos Guillermo |
| USA-DOE | MIT | Goncharov Maxim |
| USA-DOE | MIT | Iiyama Yutaro |
| USA-DOE | MIT | Klute Markus |
| USA-DOE | MIT | Kovalskiy Dmytro |
| USA-DOE | MIT | Maier Benedikt |

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| USA-DOE | MIT | Marini Andrea Carlo |
| USA-DOE | MIT | Paus Christoph Maria Ernst |
| USA-DOE | MIT | Salfeld-Nebgen Jacob |
| USA-DOE | NORTHWESTERN | Bhattacharya Saptaparna |
| USA-DOE | NORTHWESTERN | Charaf Otman |
| USA-DOE | NORTHWESTERN | Hahn Kristan Allan |
| USA-DOE | NORTHWESTERN | Odell Nathaniel Jay |
| USA-DOE | NORTHWESTERN | Schmitt Michael Henry |
| USA-DOE | NORTHWESTERN | Sung Kevin |
| USA-DOE | NORTHWESTERN | Trovato Marco |
| USA-DOE | NORTHWESTERN | Velasco Mayda Marie |
| USA-DOE | OHIO-STATE | Alimena Juliette |
| USA-DOE | OHIO-STATE | Antonelli Louis James |
| USA-DOE | OHIO-STATE | Bylsma Benjamin |
| USA-DOE | OHIO-STATE | Durkin Lloyd Stanley |
| USA-DOE | OHIO-STATE | Francis Brian Patrick |
| USA-DOE | OHIO-STATE | Hill Christopher Scott |
| USA-DOE | OHIO-STATE | Luo Wuming |
| USA-DOE | OHIO-STATE | Winer Brian |
| USA-DOE | PRINCETON | Elmer Peter |
| USA-DOE | PRINCETON | Hardenbrook Joshua |
| USA-DOE | PRINCETON | Lange David |
| USA-DOE | PRINCETON | Marlow Daniel |
| USA-DOE | PRINCETON | Ojalvo Isabel Rose |
| USA-DOE | PRINCETON | Olsen James David |
| USA-DOE | PRINCETON | Palmer Christopher Allan |
| USA-DOE | PRINCETON | Stickland David |
| USA-DOE | PRINCETON | Tully Christopher |
| USA-DOE | PURDUE | Barker Anthony William |
| USA-DOE | PURDUE | Folgueras Santiago |
| USA-DOE | PURDUE | Jones Matthew Timothy |
| USA-DOE | PURDUE | Jung Andreas Werner |
| USA-DOE | PURDUE | Khatiwada Ajeeta |
| USA-DOE | PURDUE | Neumeister Norbert |
| USA-DOE | PURDUE | Schulte Jan-Frederik |
| USA-DOE | RICE | Ecklund Karl Matthew |
| USA-DOE | RICE | Padley Paul |
| USA-DOE | RICE | Roberts Jabus |
| USA-DOE | RICE | Rorie Jamal Tildon |
| USA-DOE | ROCHESTER | Bodek Arie |
| USA-DOE | ROCHESTER | de Barbaro Pawel Jan |
| USA-DOE | ROCHESTER | Demina Regina |
| USA-DOE | ROCHESTER | Galanti Mario |

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| USA-DOE | ROCHESTER | Garcia-bellido Aran Angel |
| USA-DOE | ROCHESTER | Han Ji Yeon |
| USA-DOE | ROCHESTER | Hindrichs Otto Heinz |
| USA-DOE | ROCHESTER | Khukhunaishvili Aleko |
| USA-DOE | ROCHESTER | Tan Ping |
| USA-DOE | ROCHESTER | Verzetti Mauro |
| USA-DOE | ROCHESTER | Vishnevskiy Dmitry |
| USA-DOE | TENNESSEE | Delannoy Sotomayor Andres Guillermo |
| USA-DOE | TENNESSEE | Spanier Stefan |
| USA-DOE | TEXAS-TAMU | Dalchenko Mykhailo |
| USA-DOE | TEXAS-TAMU | Eusebi Ricardo |
| USA-DOE | TEXAS-TAMU | Gilmore Jason |
| USA-DOE | TEXAS-TAMU | Kamon Teruki |
| USA-DOE | TEXAS-TAMU | Marley Daniel Edison |
| USA-DOE | TEXAS-TAMU | Patel Rishi Gautam |
| USA-DOE | TEXAS-TAMU | Pernie Luca |
| USA-DOE | TEXAS-TAMU | Rathjens Denis |
| USA-DOE | TEXAS-TAMU | Safonov Alexei |
| USA-DOE | TEXAS-TAMU | Ulmer Keith Arthur |
| USA-DOE | TEXAS-TECH | Akchurin Nural |
| USA-DOE | TEXAS-TECH | Damgov Jordan |
| USA-DOE | TEXAS-TECH | De Guio Federico |
| USA-DOE | TEXAS-TECH | Kunori Shuichi |
| USA-DOE | TEXAS-TECH | Lee Sung Won |
| USA-DOE | TEXAS-TECH | Peltola Timo Hannu Tapani |
| USA-DOE | TEXAS-TECH | Volobouev Igor |
| USA-DOE | UCDAVIS | Chertok Maxwell |
| USA-DOE | UCDAVIS | Conway John Stephen |
| USA-DOE | UCDAVIS | Cox Peter Timothy |
| USA-DOE | UCDAVIS | Erbacher Robin |
| USA-DOE | UCDAVIS | Mulhearn Michael |
| USA-DOE | UCDAVIS | Pilot Justin Robert |
| USA-DOE | UCDAVIS | Tripathi Mani |
| USA-DOE | UCLA | Bachtis Michail |
| USA-DOE | UCLA | Cousins Robert |
| USA-DOE | UCLA | Florent Alice |
| USA-DOE | UCLA | Hauser Jay |
| USA-DOE | UCLA | Ignatenko Mikhail |
| USA-DOE | UCLA | Mc Coll Nickolas William |
| USA-DOE | UCLA | Regnard Simon Jean |
| USA-DOE | UCLA | Saltzberg David Paul |
| USA-DOE | UCLA | Valuev Viatcheslav |

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| USA-DOE | UCRIVERSIDE | Bouvier Elvire |
| USA-DOE | UCRIVERSIDE | Clare Robert |
| USA-DOE | UCRIVERSIDE | Gary John |
| USA-DOE | UCRIVERSIDE | Karapostoli Georgia |
| USA-DOE | UCRIVERSIDE | Long Owen Rosser |
| USA-DOE | UCRIVERSIDE | Paneva Mirena Ivova |
| USA-DOE | UCRIVERSIDE | Wimpenny Stephen |
| USA-DOE | UCSB | Campagnari Claudio |
| USA-DOE | UCSB | Carron Montero Sebastian Fernando |
| USA-DOE | UCSB | Dutta Valentina |
| USA-DOE | UCSB | Franco Sevilla Manuel |
| USA-DOE | UCSB | Gouskos Loukas |
| USA-DOE | UCSB | Incandela Joseph Robert |
| USA-DOE | UCSB | Ovcharova Ana Krasimirova |
| USA-DOE | UCSB | Richman Jeffrey |
| USA-DOE | UCSB | Stuart David |
| USA-DOE | UCSB | Suarez Silva Indara Mayeli |
| USA-DOE | UCSB | Yoo Jae Hyeok |
| USA-DOE | UCSD | Branson James |
| USA-DOE | UCSD | Chang Philip |
| USA-DOE | UCSD | Gerosa Raffaele Angelo |
| USA-DOE | UCSD | Holzner Andre Georg |
| USA-DOE | UCSD | Kole Gouranga |
| USA-DOE | UCSD | Krutelyov Vyacheslav |
| USA-DOE | UCSD | Letts James |
| USA-DOE | UCSD | Masciovecchio Mario |
| USA-DOE | UCSD | Olivito Dominick John |
| USA-DOE | UCSD | Pieri Marco |
| USA-DOE | UCSD | Sharma Vivek |
| USA-DOE | UCSD | Tadel Matevz |
| USA-DOE | UCSD | Vartak Adish |
| USA-DOE | UCSD | Wood John Garland |
| USA-DOE | UCSD | Wuerthwein Frank Karl |
| USA-DOE | UCSD | Yagil Avraham |
| USA-DOE | UCSD | Zevi Della Porta Giovanni |
| USA-DOE | VIRGINIA-UNIV | Barria Patrizia |
| USA-DOE | VIRGINIA-UNIV | Cox Bradley Burton |
| USA-DOE | VIRGINIA-UNIV | Hirosky Robert James |
| USA-DOE | VIRGINIA-UNIV | Ledovskoy Alexander |
| USA-DOE | VIRGINIA-UNIV | Li Hengne |
| USA-DOE | VIRGINIA-UNIV | Neu Christopher |
| USA-DOE | VIRGINIA-UNIV | Sinthuprasith Tutanon |
| USA-DOE | WAYNE | Harr Robert Francis |

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| USA-DOE | WAYNE | Karchin Paul Edmund |
| USA-DOE | WAYNE | Sturdy Jared |
| USA-DOE | WISCONSIN | Caillol Cecile |
| USA-DOE | WISCONSIN | Dasu Sridhara Rao |
| USA-DOE | WISCONSIN | Duric Senka |
| USA-DOE | WISCONSIN | Gomber Bhawna |
| USA-DOE | WISCONSIN | Herndon Matthew Fairbanks |
| USA-DOE | WISCONSIN | Klabbers Pamela Renee |
| USA-DOE | WISCONSIN | Lanaro Armando |
| USA-DOE | WISCONSIN | Savin Alexander |
| USA-DOE | WISCONSIN | Smith Wesley |
| USA-DOE | NORTHEASTERN | Orimoto Toyoko Jennifer |
| USA-DOE | ALABAMA-UNIV | Cooper Seth Isaac |
| USA-DOE | ALABAMA-UNIV | Henderson Conor |
| USA-DOE | ALABAMA-UNIV | Rumerio Paolo |
| USA-DOE | ALABAMA-UNIV | West Christopher Alan |
| USA-DOE-NP | MARYLAND | Mignerey Alice Louise Cox |
| USA-DOE-NP | MIT | Cali Ivan Amos |
| USA-DOE-NP | MIT | Innocenti Gian Michele |
| USA-DOE-NP | MIT | Lee Yen-Jie |
| USA-DOE-NP | MIT | Mironov Camelia Maria |
| USA-DOE-NP | MIT | Roland Christof |
| USA-DOE-NP | MIT | Roland Gunther Manfred |
| USA-DOE-NP | MIT | Stephans George Stewart |
| USA-DOE-NP | MIT | Wyslouch Boleslaw |
| USA-DOE-NP | PURDUE | Qiu Hao |
| USA-DOE-NP | PURDUE | Wang Fuqiang |
| USA-DOE-NP | PURDUE | Xie Wei |
| USA-DOE-NP | RICE | Chen Zhenyu |
| USA-DOE-NP | RICE | Geurts Franciscus |
| USA-DOE-NP | RICE | Guilbaud Maxime |
| USA-DOE-NP | RICE | Li Wei |
| USA-DOE-NP | CHICAGO | Evdokimov Olga |
| USA-DOE-NP | CHICAGO | Hofman David Jonathan |
| USA-DOE-NP | CHICAGO | Jung Kurt |
| USA-DOE-NP | CHICAGO | Kamin Jason Adrian |
| USA-DOE-NP | KANSAS-UNIV | Murray Michael Joseph |
| USA-DOE-NP | KANSAS-UNIV | Sanders Stephen James |
| USA-DOE-NP | KANSAS-UNIV | Tapia Takaki Daniel |
| USA-DOE-NP | KANSAS-UNIV | Wang Quan |
| USA-DOE-NP | VANDERBILT | Greene Senta |
| USA-DOE-NP | VANDERBILT | Tuo Shengquan |
| USA-DOE-NP | VANDERBILT | Velkovska Julia Apostolova |

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| USA-NSF | PUERTO_RICO | Malik Sudhir |
| USA-NSF | PUERTO_RICO | Norberg Scarlet Rachel |
| USA-NSF | UCDAVIS | Calderon De La Barca Manuel |
| USA-NSF | WASHINGTON-CUA | Bartek Rachel |
| USA-NSF | WASHINGTON-CUA | Dominguez Aaron |
| USA-NSF | CHICAGO | Apanasevich Leonard |
| USA-NSF | CHICAGO | Berry Douglas |
| USA-NSF | CHICAGO | Cavanaugh Richard |
| USA-NSF | CHICAGO | Gerber Cecilia Elena |
| USA-NSF | CHICAGO | Mills Corrinne |
| USA-NSF | CHICAGO | Tonjes Marguerite Belt |
| USA-NSF | CHICAGO | Varelas Nikolaos |
| USA-NSF | CHICAGO | Wu Zhenbin |
| USA-NSF | CORNELL | Alexander James |
| USA-NSF | CORNELL | Cheng Yangyang |
| USA-NSF | CORNELL | Patterson Ritchie J. |
| USA-NSF | CORNELL | Rinkevicius Aurelijus |
| USA-NSF | CORNELL | Ryd Anders Per Erik |
| USA-NSF | CORNELL | Skinnari Louise |
| USA-NSF | CORNELL | Soffi Livia |
| USA-NSF | CORNELL | Thom Julia |
| USA-NSF | CORNELL | Tucker Jordan Matthew |
| USA-NSF | CORNELL | Wittich Peter |
| USA-NSF | JOHNS-HOPKINS | Blumenfeld Barry |
| USA-NSF | JOHNS-HOPKINS | Gritsan Andrei |
| USA-NSF | JOHNS-HOPKINS | Maksimovic Petar |
| USA-NSF | JOHNS-HOPKINS | Swartz Morris |
| USA-NSF | JOHNS-HOPKINS | Xiao Meng |
| USA-NSF | KANSAS-UNIV | Baringer Philip |
| USA-NSF | KANSAS-UNIV | Bean Alice |
| USA-NSF | KANSAS-UNIV | Khalil Sadia |
| USA-NSF | KANSAS-UNIV | Kropivnitskaya Anna |
| USA-NSF | KANSAS-UNIV | Majumder Devdatta |
| USA-NSF | KANSAS-UNIV | Rogan Christopher Sean |
| USA-NSF | KANSAS-UNIV | Wilson Graham |
| USA-NSF | NEBRASKA | Bloom Kenneth Arthur |
| USA-NSF | NEBRASKA | Claes Daniel |
| USA-NSF | NEBRASKA | Golf Frank |
| USA-NSF | NEBRASKA | Gonzalez Suarez Rebeca |
| USA-NSF | NEBRASKA | Kravchenko Ilya |
| USA-NSF | NEBRASKA | Snow Gregory |
| USA-NSF | NEBRASKA | Stieger Benjamin Bastian |
| USA-NSF | NORTHEASTERN | Barberis Emanuela |

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| USA-NSF | NORTHEASTERN | Massironi Andrea |
| USA-NSF | NORTHEASTERN | Morse David Michael |
| USA-NSF | NORTHEASTERN | Wood Darien |
| USA-NSF | NOTRE_DAME | Hildreth Michael |
| USA-NSF | NOTRE_DAME | Hurtado Anampa Kenyi Paolo |
| USA-NSF | NOTRE_DAME | Jessop Colin |
| USA-NSF | NOTRE_DAME | Karmgard Daniel |
| USA-NSF | NOTRE_DAME | Lannon Kevin Patrick |
| USA-NSF | NOTRE_DAME | Loukas Nikitas |
| USA-NSF | NOTRE_DAME | Marinelli Nancy |
| USA-NSF | NOTRE_DAME | Musienko Yuri |
| USA-NSF | NOTRE_DAME | Ruchti Randal |
| USA-NSF | NOTRE_DAME | Smith Geoffrey |
| USA-NSF | NOTRE_DAME | Taroni Silvia |
| USA-NSF | NOTRE_DAME | Wayne Mitchell |
| USA-NSF | PURDUE-CALUMET | Cheng Tongguang |
| USA-NSF | PURDUE-CALUMET | Parashar Neeti |
| USA-NSF | RUTGERS | Agapitos Antonis |
| USA-NSF | RUTGERS | Chou John Paul |
| USA-NSF | RUTGERS | Gershtein Yury |
| USA-NSF | RUTGERS | Halkiadakis Eva |
| USA-NSF | RUTGERS | Lath Amitabh |
| USA-NSF | RUTGERS | Nash Kevin Connor |
| USA-NSF | RUTGERS | Saka Halil |
| USA-NSF | RUTGERS | Salur Sevil |
| USA-NSF | RUTGERS | Schnetzer Stephen Richard |
| USA-NSF | RUTGERS | Somalwar Sunil |
| USA-NSF | RUTGERS | Stone Robert |
| USA-NSF | RUTGERS | Thomas Scott |
| USA-NSF | SUNY-BUFFALO | Dolen James |
| USA-NSF | SUNY-BUFFALO | Iashvili Ia |
| USA-NSF | SUNY-BUFFALO | Kharchilava Avtandil |
| USA-NSF | SUNY-BUFFALO | Nguyen Hai Duong |
| USA-NSF | SUNY-BUFFALO | Rappoccio Salvatore |
| USA-NSF | VANDERBILT | Gurrola Alfredo |
| USA-NSF | VANDERBILT | Johns Willard Ellison |
| USA-NSF | VANDERBILT | Melo Andrew Malone |

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| USA-NSF | VANDERBILT | Sheldon Paul Douglas |
| USA-OTHER | MARYLAND | Kellogg Richard |
| USA-OTHER | TEXAS-TAMU | Bouhali Othmane |
| USA-OTHER | TEXAS-TAMU | Castaneda Hernandez Alfredo Martin |
| USA-OTHER | UCRIVERSIDE | Hanson Gail |
| USA-OTHER | UCSD | Padhi Sanjay |
| USA-OTHER | LIVERMORE | Rebassoo Finn O'neill |
| USA-OTHER | LIVERMORE | Wright Douglas |

13.2 2018 Maintenance & Operations Cat. A Sharing (based on Annex 13.1)

ANNEX 1**PhD Scientists per Funding Agency Based on the Annually Revised Annex 13 of the M&O MoU**

The List of Names is Available at

https://cms-docdb.cern.ch/cgi-bin/DocDB/RetrieveFile?docid=3038&filename=2018_PhD_list.pdf&version=12

(Count closed on 11 September, 2017)

| Institute FA | PhD # | PhD % |
|--------------------|-------------|----------------|
| Austria | 18 | 1.28% |
| Belgium-FNRS | 24 | 1.71% |
| Belgium-FWO | 17 | 1.21% |
| Brazil-FAPESP | 7 | 0.50% |
| Brazil-RENAFAE | 21 | 1.50% |
| Bulgaria | 8 | 0.57% |
| CERN | 73 | 5.21% |
| China | 21 | 1.50% |
| Colombia | 3 | 0.21% |
| Croatia | 10 | 0.71% |
| Cyprus | 7 | 0.50% |
| Ecuador | 2 | 0.14% |
| Egypt | 3 | 0.21% |
| Estonia | 4 | 0.29% |
| Finland | 10 | 0.71% |
| France-CEA | 14 | 1.00% |
| France-IN2P3 | 46 | 3.28% |
| Germany-BMBF | 53 | 3.78% |
| Germany-DESY | 42 | 3.00% |
| Greece | 14 | 1.00% |
| Hungary | 10 | 0.71% |
| India | 43 | 3.07% |
| Iran | 5 | 0.36% |
| Ireland | 1 | 0.07% |
| Italy | 190 | 13.56% |
| Korea | 32 | 2.28% |
| Lithuania | 2 | 0.14% |
| Malaysia | 3 | 0.21% |
| Mexico | 13 | 0.93% |
| New Zealand | 2 | 0.14% |
| Pakistan | 3 | 0.21% |
| Poland | 14 | 1.00% |
| Portugal | 8 | 0.57% |
| RDMS-DMS | 23 | 1.64% |
| RDMS-Russia* | 74 | 5.28% |
| Serbia | 3 | 0.21% |
| Spain | 42 | 3.00% |
| Switzerland-ETHZ | 15 | 1.07% |
| Switzerland-PSI | 6 | 0.43% |
| Switzerland-UNIV | 9 | 0.64% |
| Taipei | 16 | 1.14% |
| Thailand | 3 | 0.21% |
| Turkey | 12 | 0.86% |
| United Kingdom | 59 | 4.21% |
| USA-DOE | 301 | 21.48% |
| USA-DOE-NP | 27 | 1.93% |
| USA-NSF | 81 | 5.78% |
| USA-OTHER | 7 | 0.50% |
| Grand Total | 1401 | 100.00% |

*The figures include PhDs financed from sources external to the Funding Agency

⁴ Latvia will appear in the M&O Cat. A sharing in the 2019 PhD list to be closed in September 2018

Annex 14: Non-Member States for which CERN will partially pay the energy costs

- 14.1 CERN will partially pay the energy costs for the following CERN Non-Member States by virtue of their contributions to the construction of the LHC machine.
1. Canada
 2. Japan
 3. Russian Federation
 4. United States of America
- 14.2 Under a co-operation agreement Israel contributes to CERN 20% of the amount that would normally be expected of it as a Member State. The further provisions of this co-operation agreement on the use of these funds lead to the conclusion that CERN should pay 16% of the energy costs for this country.

Annex 15: Formula used for determining the sharing of the CERN payment of energy costs amongst the eligible non-Member States.

- M_i = contribution to the LHC machine of country i
- M_{MS} = contribution to the LHC machine of CERN Member States taken together
- M_{NMS} = contribution to the LHC machine of the non-Member States listed in 0.1 taken together
- G_i = GDP of country i (see explanatory note below)
- A_i = category A costs for country i
- E_{MS} = energy costs of the Member States together
- E_{NMS} = energy costs of the non-Member States listed in Annex 14.1 taken together
- E_i = Energy costs attributable to country i

The CERN share $E_{NMS(CERN)}$ of E_{NMS} is determined by the LHC machine contribution of these countries relative to the contribution of the CERN Member States, i.e.

$$E_{NMS(CERN)} = E_{NMS} \cdot M_{NMS} / M_{MS}$$

Beyond this, the algorithm used for sharing amongst the eligible non-Member States is:

$$E_i = k \cdot (M_i / G_i) \cdot A_i \quad \text{where} \quad k = E_{NMS(CERN)} / \sum_{NMS} ((M_i / G_i) \cdot A_i)$$

Explanatory note on the calculation of GDPs

The Gross Domestic Products to be taken into account in preparation for the decision in the autumn of year n on the payment of energy costs by CERN in year $n+1$ to contributing non-Member States are those for the years of LHC construction (1996-2006). Thus, initially the averaged Gross Domestic Product in Swiss francs for each contributing non-Member State is calculated as described in the following two paragraphs.

1. The Gross Domestic Product (GDP) in US Dollars of each contributing non-Member State for the years 1996 to m , the last year available ($m \leq n-1$), is obtained from the document "International Financial Statistics" published by the International Monetary Fund (IMF), Washington DC.
2. An average of the resulting data for each contributing non-Member State is calculated by the application of the following formula:

$$(GDP_{1996} + GDP_{1997} + \dots + GDP_m) / (m-1996+1)$$

When m reaches 2006, the averaged GDP for the country in question will cover the whole period of LHC construction and will then be used unchanged in subsequent years.

Annex 16: Procedure for the payment of Category A contributions

For Category A expenses, CERN will issue, each calendar year, on the basis of the agreed costs and sharing, invoices in Swiss francs to the Funding Agencies of the various Institutes for payment during that year; any necessary adjustments will be made and taken into account in the following year. Payment of 50% of the amount invoiced will be due not later than 10 February and the remaining 50% not later than 10 June. Advance payments are encouraged. The RRB will be informed at its autumn meeting each year of the interest gained or lost by the Collaboration.

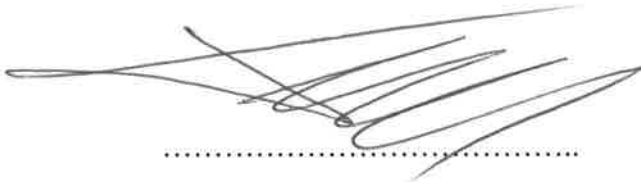
The European Organization for Nuclear Research (CERN)
and
the Ministry of Education and Science of the Republic of Latvia

declare that they agree on the present Memorandum of Understanding for the CMS Experiment.

Signed in *Riga*

on *May 14,* 2018

for CERN



Dr. Frédérick Bordry
Director for Accelerators and Technology

Signed in *Riga*

on *May 14,* 2018

for the Ministry of Education and
Science



Dr. Kārlis Šadurskis
Minister