MEMORANDUM OF UNDERSTANDING

between

the Belle II International Collaboration

and

the High Energy Accelerator Research Organization, KEK
1,1 Oho, Tsukuba-shi
Ibaraki 305-0801, Japan
(hereinafter referred to as "KEK")

and

the Federal Ministry of Science, Research and Economy
Minoritenplatz 5
1014 Wien
(hereinafter referred as "BMWFW")

and

the Austrian Academy of Science
Dr. Ignaz Seipel-Platz 2
1010 Wien
(hereinafter referred as "ÖAW")

Preamble

The Belle II experiment will operate at the SuperKEKB storage ring at KEK in Tsukuba, Japan. SuperKEKB is an asymmetric electron-positron collider operating at a center of mass energy around 10.58 GeV and at an instantaneous luminosity 40 times higher than at KEKB. Belle II will search for new sources of CP violation, for new hadronic states, perform precision measurements of Standard Model processes, study very rare flavour-changing neutral current processes, and search for lepton flavour-violation.
To fully exploit the power of the new high luminosity collider, Belle II which uses parts of the former Belle detector, will be equipped with new tracking and particle identification systems. In addition, the data acquisition, storage and processing systems as well as the on-line and off-line software will be upgraded or replaced. The Belle II project is described in the Technical Design Report KEK Report 2010-1. An international collaboration, which presently consists of about 600 people from 95 institutes in 23 countries, has been formed to participate in this unique world-wide project.
To ensure the successful design, construction and operation of the Belle II experiment and its funding, agreement to this collaboration will be effected through individual Memoranda of Understanding (MOU) between Belle II management, the host laboratory KEK and representatives of all funding agencies supporting the participating institutes of a given country. The former are members of the Financial Oversight Panel (FOP) which will meet on a yearly basis to monitor progress of the projects and the financial situation. This MOU is not legally binding, but the parties recognize that the success of the Collaboration depends on all its members adhering to its provisions.
The signing parties agree that they will make their best effort to collaborate in a congenial and constructive manner to the design and construction of the detector system, data taking, processing and analysis, and to the ultimate success of the experiment.

Article I
Purpose of this MOU

This MOU relates to the construction and operation of the Belle II detector. Its purpose is to define the rights and duties of the Austrian Belle II members supported by BMWFW and ÖAW (at present this is only the Institute of High Energy Physics, HEPHY) and of KEK as the hostlaboratory, and to set out organizational, managerial and financial guidelines to be followed by the Collaboration.

Article II
Sharing of Responsibilities within the Belle II Collaboration

The Belle II detector has been described in detail in the Technical Design Report KEK Report 2010-1 submitted in 2010. It is understood by the Collaboration that approximately one half of the cost for detector construction will be covered by KEK, while the rest will be covered by the other institutes. The current list of Belle II member institutes is shown in the Appendix.

Deliverables: The Austrian members contribute to the construction of the Belle II silicon vertex detector (SVD). Deliverables for the SVD production are:

- Trapezoidal silicon sensors for all four layers of the SVD
- Readout electronics (FADC system) for the entire SVD
- Readout hybrid boards and junction boxes (dock)
- APVDAQ systems for ladder tests at all assembly sites

- CO_2 cooling tubes
- Auxillary parts for SVD ladder assembly (all layers): Carbon fibre support ribs and other ladder parts (H-shape, screws, Origami connectors, thinning of APV chips, Airexsheets, CO_2 tube clamps, cables)

The Austrian members are in charge of the mechanical SVD design and of the assembly (including wire bonding) of the SVD layer 5 ladders. They will make their best efforts to design, to produce final prototypes, to construct, to calibrate, to transport, to assemble, to install and commission all the deliverables within the limits of their funding.

M&O: Starting from JFY2013, all institutes of the Belle II collaboration are expected to make contributions towards the operation and maintenance of the detector in the form of a common fund, prorated to the number of PhD physicists of Belle II. On a yearly basis, the budget needed for maintenance and operation, the list of PhD physicists and the assignment of costs to individual funding agencies are established in the meeting of the Finance Board of Belle II and agreed upon by the Financial Oversight Panel.

Computing: To meet the high demands on computing resources, all MOU signing parties agree to contribute to the needed resources in an appropriate way. These deliverables are to produce, store, and make available for analysis a fraction of the total Belle II dataset. The fraction corresponds to the fraction of PhD physicists in the Belle II collaboration. The access to the computing resources and produced data is provided to all Belle II members via standard grid interfaces.

Shifts: All institutes and members must satisfy their institutional and personal shift quotas defined in Belle II by-laws. It is understood that appropriate funding must be provided to perform these duties on site.
Meeting attendance: Senior members of the groups should make their best effort to attend collaboration meetings and sub-group meetings related to their work.

Reporting: The progress of the activities of the participating institutes will be reported on a regular base, a summary will be given at the annual FOP meetings.

In the event of cost overruns, these will first be brought, by the institute(s) concerned, to the attention of the collaboration and then to the FOP, if solutions have not been found. The collaboration will propose ways of accommodating such overruns and seek the endorsement of the FOP.

Article III
Belle II By-laws

In addition to the stipulations of this MOU, it is understood that all members and member institutes abide by the by-laws of the Belle II collaboration. These documents (to be found on the Belle II web page http://belle2.kek.jp/) describe the management system of the experiment, the rules of conduct, and the individual contributions of all member institutes to the detector construction and operation.

Article IV
General Conditions for Experiments Performed at KEK

The signing parties recognise the rules and regulations including ones for the safety under which experiments will be carried out and the collaborating individuals will work at the KEK laboratory.

Article V
Rights and Duties

The Belle II members covered by this MOU have all the individual rights and duties as all other Belle II collaborators. They are entitled to join the operational phase of the project and to participate in the scientific exploitation of the data acquired.

Article VI
Responsibilities of KEK as Host Laboratory

KEK agrees to provide appropriate infrastructure for the detector and services for the collaboration within its resources. KEK will make all possible efforts to complete SuperKEKB on schedule. KEK will consult and inform the Belle II collaboration of all its plans to maintain the schedule of accelerator operations.

Article VII
Intellectual Property and Information

Management of any intellectual properties and informations shall be subject to the manner of the Belle II collaboration. When intellectual properties are jointly born by the Austrian members and KEK, or born by Austrian members using KEK's facilities or equipment, the treatment of the rights for the properties shall be subject to the discussion between the said parties, notwithstanding the former sentence.

Article VIII
Duration

This MOU shall become effective upon signature from all parties. This MOU is valid for five years and may be extended at any time by mutual agreement of its parties or their appointed successors. It shall terminate on the day when a future MOU is signed that replaces the current one or when the Belle II collaboration dissolves officially, or shall terminate by joint agreement or by one party giving the other twelve months prior written notification.

			(KEK) JAPAN
			Kavli IPMU (WPI), the University of Tokyo JAPAN
			Nagoya Univ. JAPAN
			Nara Women's Univ. JAPAN
			Niigata Univ. JAPAN
			Nuclear Physics Consortium (NPC) JAPAN
			Osaka City Univ. JAPAN
			Toho Univ. JAPAN
			Tohoku Univ. JAPAN
			Tokyo Metropolitan Univ. JAPAN
			U-Tokyo JAPAN
			Yamagata Univ. JAPAN
KOREA	9	37	Chonnam National Univ. KOREA
			Gyeongsang National Univ. KOREA
			Hanyang Univ. KOREA
			Korea Institute of Science and Technology Information(KISTI) KOREA
			Korea Univ. KOREA
			Kyungpook National Univ. KOREA
			Seoul National Univ. KOREA
			Soongsil Univ. KOREA
			Yonsei Univ. KOREA
MALAYSIA	1	6	Univ. of Malaya MALAYSIA
MEXICO	4	6	Benemerita Universidad Autonoma de Puebla (BUAP) MEXICO
			Centro de Investigacion y estudios avanzados del Instituto Politecnico Nacional MEXICO
			Universidad Autonoma de Sinaloa(UAS) MEXICO
			Universidad Nacional Autonoma de Mexico(UNAM) MEXICO
VIET NAM	1	3	Institute of Physics VIET NAM
POLAND	1	11	Institute of Nuclear Physics PAN POLAND
RUSSIA	4	37	Budker Institute of Nuclear Physics(BINP) RUSSIA
			Institute for High Energy Physics RUSSIA
			Institute for Theoretical and Experimental Physics RUSSIA
			National Research Nuclear Univ.(MEPhI) RUSSIA
SLOVENIA	2	15	Univ. of Ljubljana SLOVENIA
			Univ. of Nova Gorica SLOVENIA
SPAIN	1	4	Instituto de Fîsica Corpuscular(IFIC) SPAIN
TAIWAN	4	23	Fu Jen Catholic Univ. TAIWAN
			National Central Univ. TAIWAN
			National Taiwan Univ.(NTU) TAIWAN
			National United Univ. TAIWAN
THAILAND	1	4	Chiang Mai Univ. THAILAND
TURKEY	1	3	Middle East Technical Univ.(METU) TURKEY
U.S.A.	13	67	Carnegie Mellon Univ. U.S.A.
			Indiana Univ. U.S.A.

			Kennesaw State Univ. U.S.A.
			Luther College U.S.A.
			Pacific Northwest National Laboratory(PNNL) U.S.A.
			Univ. of Cincinnati U.S.A.
			Univ. of Hawaii U.S.A.
			Univ. of Mississippi U.S.A.
			Univ. of Pittsburgh U.S.A.
			Univ. of South Alabama U.S.A.
			Univ. of South Carolina U.S.A.
			Virginia Polytechnic Institute and State Univ. U.S.A.
			Wayne State Univ. U.S.A.
UKRAINE	2	6	Institute for Scintillation Materials UKRAINE
			Taras Shevchenko National University of Kiev(Kyiv) UKRAINE

Signed on behalf of the Belle II Collaboration:

Tom Browder
Belle II spokesperson

Signed on behalf of the KEK:

Atsuto Suzuki
Director General

Masanori Yamauchi
IPNS Director

Yoshihide Sakai
Belle II project manager

Signed on behalf of the BMWFW:

Daniel Weselka
Head of Basic Research
and Research Infrastructures

Signed on behalf of the ÖAW:

Jochen SCHIECK
Director of HEPHY
On behalf of
Anton Zeilinger
ÖAW President

Jochen SCHIECK
Director of HEPHY
On behalf of
Michael Alram
ÖAW Vice-president

KEK, November 4 , 2014

Appendix

Members of the Belle II Collaboration as of February 2014

Country	Inst.	Members	Institute Name
SAUDI ARABIA	1	3	Univ. of Tabuk SAUDI ARABIA
AUSTRALIA	2	15	Univ. of Melbourne AUSTRALIA
			Univ. of Sydney AUSTRALIA
AUSTRIA	1	12	HEPHY, Austrian Academy of Sciences AUSTRIA
CANADA	4	17	McGill Univ. CANADA
			Univ. of British Columbia CANADA
			Univ. of Montreal CANADA
			Univ. of Victoria CANADA
CHINA	4	19	Beihang university, CHINA
			Institute of High Energy Physics CHINA
			Peking Univ. CHINA
			Univ. of Science and Technology of China CHINA
CZECH	1	7	Charles Univ. in Prague CZECH
GERMANY	10	85	Deutsches Elektronen-Synchrotron(DESY) GERMANY
			Karlsruhe Institute of Technology(KIT) GERMANY
			Ludwig Maximilians Univ. Muenchen(LMU) GERMANY
			Max Planck Institut fur Physik Muenchen GERMANY
			Semiconductor Laboratory of the Max Planck Society GERMANY
			Technical Univ. of Munich(Technische Universitaet Muenchen) GERMANY
			Univ. of Bonn GERMANY
			Univ. of Giessen GERMANY
			Univ. of Goettingen GERMANY
			Univ. of Heidelberg GERMANY
INDIA	6	21	Indian Institute of Technology Bhubaneswar INDIA
			Indian Institute of Technology Guwahati INDIA
			Indian Institute of Technology Madras INDIA
			Institute of Mathematical and Sciences INDIA
			Panjab Univ. INDIA
			Tata Institute of Fundamental Research INDIA
ITALY	9	46	INFN Laboratori Nazionali di Frascati ITALY
			INFN Roma1 and Enea Casaccia ITALY
			INFN and Federico II Univ. Napoli ITALY
			INFN and Univ. Padova ITALY
			INFN and Univ. Perugia ITALY
			INFN and Univ. Pisa ITALY
			INFN and Univ. Roma Tre ITALY
			INFN and Univ. Torino ITALY
			INFN and Univ. Trieste ITALY
JAPAN	13	144	Chiba Univ. JAPAN
			High Energy Accelerator Research Organization

ÖAW
Österreichische Akademie
der Wissenschaften

Vollmacht

mit welcher die

Österreichische Akademie der Wissenschaften

Dr. Ignaz-Seipel Platz 2

1010

vertreten durch den Präsidenten Prof. Anton Zeilinger und

den Vizepräsidenten Doz. Michael Alram

Herrn

Prof. Dr. Jochen Schieck, geb. am 30.3.1971 ,

bevollmächtigt in ihrem Namen das dieser Vollmacht als integrierter Bestandteil in Beilage 1 angeschlossene Memorandum of Understanding zwischen KEK und Österreich zu unterzeichnen.

Wien, am 25.9.2014

Für den Vollmachtgeber:

Prof. Anton Zeilinger

Doz. Michael Alram