

Addendum No. 7

to the
Memorandum of Understanding
for Collaboration in the Construction of the ALICE Detector and
Detection of QGP

Definition of the Contributions of China

Considering that:

The ALICE Experiment is covered by a Memorandum of Understanding (MoU) setting out the responsibilities of the different participating Institutes and Funding Agencies for the construction of the ALICE detector¹.

Participation of the Chinese Team in the construction of the ALICE detector has evolved with respect to the responsibilities documented in the MoU¹.

It is agreed as follows:

¹ Memorandum of Understanding for Collaboration in the Construction of the ALICE Detector, ALICE RRB-D 00-41.

1. Introduction

- 1.1 ALICE is a general-purpose heavy-ion detector designed to study the physics of strongly interacting matter and the quark-gluon plasma (QGP) in nucleus-nucleus collisions at the LHC. It currently includes more than 1000 physicists from 90 institutions in 30 countries. The detector is designed to cope with the highest particle multiplicities anticipated for Pb-Pb reactions ($dN/dy \sim 8000$) and it will be operational at the start-up of the LHC.
- 1.2 The Institutes participating in the Collaboration are entitled to join the operational phase of the project and will have full access to all experimental data. The institutes will participate in the scientific exploitation and the achievements of the Collaboration. Details are set out the document "General Conditions applicable to Experiments Performed at CERN".
- 1.3 The purpose of this addendum is to lay down the terms of Collaboration of the Chinese Institutions in the ALICE Collaboration in conformity with the MOU signed by the representatives of the Funding Agencies as listed in Annex 2 of the MOU.

2 Terms of Collaboration

- 2.1 As their particular field of interest, the Chinese institutes, have chosen:
 1. R&D of PIN diodes (completed in 2002).
 2. Research and design (R&D), construction, production, test and commissioning of the Front End Electronics (FEE) for the PHOS detector.
 3. Installation and Integration of the ALICE detector.
 4. Development and construction of a computing grid in the Chinese Institutes, simulations, signal prediction, event reconstruction, data analysis and detection of QGP signals in ALICE.
 5. Theoretical study of quark matter, QGP properties, and QGP signals.
- 2.2 The Chinese Institutes collaborating in ALICE are the following (MOU Annex 1):
 1. Institute of Particle Physics, Huazhong (Central China) Normal University (CCNU), Wuhan, China (since 1993);
 2. Institute of Nuclear physics, China Institute of Atomic Energy(CIAE), Beijing (since 1993).
 3. Department of Electronics & Information, Huazhong University of Science & Technology(HUST), Wuhan (from 2004);
- 2.3 The Chinese Institutes are financially supported by (MOU, annex 2):
 1. The China Ministry of Education (CMoE);
 2. The National Nature Science foundation of China (NSFC) ;

3. Huazhong (Central China) Normal University (CCNU).
 4. China Institute of Atomic Energy (CIAE)
- 2.4 At the time of signing this document the following members of the Chinese Institutes, are considered as members of ALICE Collaboration (MOU, annex 4):
1. Huazhong (Central China) Normal University (CCNU):
 Xu Cai, Fuming Liu, Han Liu, Chunbin Yang, Xiaorong Wang, Enke Wang, Tao Wu, Zhongbao Yin, Daicui Zhou, Daimei Zhou.
 2. China Institute of Atomic Energy (CIAE):
 Jing Feng, Yuanyong Fu, Shouyang Hu, Chengbo Li, Xiaomei Li, Qiuying Meng, Shaojun Lu, Benhao Sa, Jiumin Yuan, Jing Zhou and Shuhua Zhou.
 3. Huazhong University of Science & Technology (HUST):
 Xi Cao, Qingxia Li, Yingzhuang Liu, Gang Su, Li Tan and Guangxi Zhu.
- 2.5 The group leader:
 The CCNU group leader : Daicui Zhou
 The CIAE group leader : Xiaomei Li
 The HUST group leader : Yingzhuang Liu

3. Financial Provisions

- 3.1 The contributions by China listed in Annex 9 of the ALICE MoU are revoked and replaced by those listed in the following table (unit = kCHF):

<i>Item</i>	<i>Amount(KCHF) Person funds</i>	<i>Amount(kCHF) Core funds</i>	<i>Total (kCHF)</i>
PHOS Fronted Electronics Cards		410	410
Test Equipment		100	100
R& D Pin-Diode		160	160
Installation & Integration		826	826
Common Funds		135	135
Trip funds and CERN local Expenses	130		130
<i>Total</i>	<i>130</i>	<i>1631</i>	<i>1761</i>

Notes:

- The R&D on PIN diodes has been completed successfully in 2002.

- The participation in Installation and Integration work corresponds to an in-kind contribution of technical manpower from 2003 – 2007 with 5-7 technician for the installation of ALICE detector.
- The contribution to the Common Fund corresponds to 10% of the total contribution (MoU Art. 6.3). Of this, membership fees of 3 Institutes * 45 kCHF = 135 kCHF must be paid in cash.
- An amount of 5 kCHF has been already paid into the the Common Fund by CCNU and rest corresponding Common Fund will be paid by CCNU and CIAE and HUST respectively in next few years.
- In the form, the CMoE funds 280kCHF, the NSFC funds 160kCHF, the CCNU funds 410kCHF, HUST funds cash 45kCHF, CIAE funds cash 45kCHF, and the manpower contribution of detector installation counts 826kCHF from the CIAE. The total contribution is 1761 kCHF.
- CCNU and HUST are responsible for the design, production and test of front end electronics (FEE). CIAE is responsible for the R&D of PIN-Diode.

4 Signatures

4.1 By signing this addendum, the Institutes supporting it accept all the terms of the MoU. The ALICE Collaboration is represented by its Spokesperson and by the CERN Chief Scientific Officer as Chair of the Resources Review Board. The Education Ministry of China is presented by the Director General of Department of Science & Technology of China, the Chinese team and the institutes are presented by the Chinese team representative and the group leaders.

For the ALICE Collaboration

For CERN

(J. Schukraft)
Spokesperson

(J. Engelen)
Chief Scientific Officer

For the China Ministry of Education

(H. Z. Xie)
Director General of Department of Science & Technology

For the Chinese Team

X. Cai
(Contact Person)

(D. C. Zhou)
(Project Coordinator)

X.M. Li
(Contact Person)

(Y.Z. Liu)
(Technical Coordinator)