

# Report on Activities of the HPPA Working Group

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*( The 15<sup>th</sup> Plenary ACFA Meeting)*

**Nov. 16-17, 2009**

**POSTECH, Korea**

**Byung-Ho Choi**

**ACFA HPPA Working Group**

Several ACFA member countries have paid attention to the HPPA technology. China, Japan and Korea have their ongoing projects. India has some R&D activities to launch an ADS project.

The HPPA WG was formed in 2000, to support regional activities for development of the HPPA key technologies, and to promote HPPA programs for the member countries.

Since the 14<sup>th</sup> meeting at KEK Japan on Nov. 10, 2008, there have been some activities; visits, information exchanges, technical collaborations and especially a joint conference.

- I. Status of the HPPA projects in the member countries
- II. Report on the HPPA mini-workshop
- III. Report on the Conference on Accelerator & Beam Utilization
- IV. Report on the cooperation among member countries
- V. Summary & Discussion

# Status of the HPPA Projects of the Member Countries

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## **China (IHEP, Tsinghua Univ)**

- CSNS: Since official approval on Sep. 23, 2008, significant R&D efforts & progresses have been made on RFQ, DTL, RCS, Target and Instruments, and prototyped many components. Especially ECR ion source and RFQ have developed successfully.
- CPHS (Compact Pulsed Hadron Source): initiated at Tsinghua Univ to develop a university neutron source based on a 13 MeV, 50 mA proton linac (RFQ+DTL)

## **Japan (JAEA-KEK)**

- J-PARC:
  - RCS: started neutron beam service with 20kW in Dec. 2008, and upgraded to 120kW in Nov 2009
  - MR: first beam acceleration up to 30 GeV in Dec. 2008, slow extraction on Jan., 2009
  - Completed the construction phase-I and had a celebration in July, 2009
  - Upgrade Project: started ACS (191~400 MeV linac) to be completed in 2012.

## **Korea (KAERI)**

- PEFP is underway
  - 20MeV linac is under operation and started beam service July, 2007.
  - Started site preparation from May 2009, accelerator building construction to start in March, 2010.
  - Phase I of PEFP is to be completed in March 2012.

## **India (BARC, VECC)**

- R&D activities of a high power proton linac for ADS application at BARC
- R&D activities of a high current cyclotron at VECC

# The ACFA HPPA Mini-Workshop

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- ▶ Objective: to support regional activities for development of the HPPA key technologies, and to promote HPPA programs for Asian countries.
- ▶ History;
  - 1<sup>st</sup> Workshop : KEK, Dec 11-12 2002, RFQ Technology
  - 2<sup>nd</sup> Workshop: KAERI, Apr 13-14 2006, DTL Technology
  - 3<sup>rd</sup> Workshop : IHEP, July 17-18 2008, RCS & Operating Experience of Linac  
Attendance: 40 (China 30, Japan 5, Korea 5)
- ▶ Plan
  - The 4<sup>th</sup> ACFA mini-workshop will be held at J-PARC/JAEA, Japan in 2011.**
  - The main topics of the 4<sup>th</sup> mini-workshop will be;
    - Commissioning of High Power Proton Accelerators
    - Operation Experiences of High Power Proton Accelerators
  - Lab tour of J-PARC;
    - Accelerator Facilities & Experimental Facilities

We hope many participations and contributions of other member countries.

# Conference on Accelerator & Beam Utilization



- KAERI has hold a series of HPPA conferences annually since 1997 to promote HPPA technologies and to support the Korean HPPA project.
- In this conference, experts from member countries of China, Japan and even USA, get together to share information and to exchange experiences related to current HPPA technologies and projects.

## The 13<sup>th</sup> Conference

**Date: October 13 ~ 14, 2009**

**Place: Hotel Hyundai, Gyeongju, Korea**

**Attendance: 230 (Japan 2, China 1, USA 4, Canada 1)**

**Presentation: 160**

**Publication: Special Edition, Journal of Korean Physical Society (May 2010)**

- ▶ Reviewed status of J-PARC, PEFP, CSNS & CPHS, and SNS
- ▶ Discussed practical collaborations

## The 14<sup>th</sup> Conference

**Date : September 2010**

- ▶ Focus on Accelerator Commissioning & Beam Utilizations

www.komac.re.kr

## The 13<sup>th</sup> International Conference on Accelerator & Beam Utilization

October 13~14, 2009  
Gyeongju, Korea

The 13<sup>th</sup> International Conference on Accelerator and Beam Utilization will be held from October 13 to 14, 2009 in Gyeongju, Korea. Inheriting the philosophy of the previous series of workshops on the same topic, the conference expands its scopes to cover more detailed issues in the particle accelerator developments and utilizations of various kinds of particle beams - electrons, protons, neutrons, photons, and heavy ions, in the wide range of research fields.

The conference consists of plenary sessions, parallel sessions and poster session. The plenary sessions will review major accelerator projects - recently commissioned, under development or planned. The parallel sessions are organized to cover advanced accelerator technology, spallation neutron source, synchrotron light source, beam applications in medical and bioscience, and radioisotope productions. In addition, the poster session is widely open for all contribution papers.

Plenary Sessions : Major accelerator projects  
Parallel Sessions : Accelerator technology, Spallation neutron source, Synchrotron light source  
Beam applications in medical and bioscience, and Radioisotope productions  
Poster Sessions : Open for all contribution papers in accelerator technology and beam utilizations

Every author is encouraged to submit a manuscript of his/her presentation by September 30, 2009. Selected papers are to be published in a special issue of the Journal of Korean Physical Society, if accepted, which will replace the conference proceedings.

Gyeongju city itself is a World Heritage Site designated by UNESCO, which encompasses the ruins of temples and palaces, outdoor pagodas and stupa, and other cultural artifacts left by the Shilla dynasty. Gyeongju will be the home of the first high power proton accelerator in Korea, being developed by the Proton Engineering Frontier Project, which will help Gyeongju restore the ancient glory by boosting the advanced science and technology for next generations. We wish you to review the most up-to-date progresses in accelerator development and beam utilizations and also to discover ancient science and high-tech from the ruins created by Shilla dynasty during the first millennium.

Organizing Committee:  
M.H. Ree (Co-Chair, POSTECH, Korea)  
S.H. Choi (Co-Chair, KAERI, Korea)  
M. Kwon (NRL, Korea)  
D.Y. Kim (NCC, Korea)  
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Important Dates  
Registration : August 24 ~ September 20, 2009  
Abstract Submission : August 24 ~ September 20, 2009  
Paper Submission : September 21 ~ 30, 2009

PEFP Proton Engineering Frontier Project

SPONSORED BY: MEST, GYEONGJU, KAERI, KPSI

## I. Collaboration between China(IHEP, Tsinghua Univ.) and Korea (PEFP/KAERI)

### 1. Technical Cooperation on Accelerator Development

- Date : Oct. 14~15, 2009
- Place : Daejeon, Korea
- Reviwer from Tsinghua Univ. : Prof. Jie Wei
- Agenda: PEFP's 7<sup>th</sup> Technical Review Meeting
  - ▶ 100 MeV Linac, RF System, Control System, 20/100 MeV Beamlines, Target
  - ▶ R&D Activities for the future expansion (RCS, SRF)

### 2. Technical Cooperation on Accelerator Components

- ▶ IHEP fabricated and delivered magnets for PEFP beam lines
  - 2 AC Magnets, 11 Dipoles, 70 Quadrupoles



# Cooperation activities among member countries (II)

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## 3. Cooperation through ROK-PRC Joint Committee on Nuclear Energy

The 9<sup>th</sup> meeting has been rescheduled to be held in 2010.

- Date / Place : TBD
- Agenda : Development of Advanced Accelerator Technology and its Applications (B-3)
  - ▶ To support and promote technical collaborations between CSNS & PEFP, between HATC at Tsinghua Univ & PEFP
  - ▶ To support on beam utilization and application of accelerator technologies in the areas of scientific R&D, industrial and medical applications.
  - ▶ To support on establishing a formal relationship between IHEP and PEFP
  - ▶ To support on establishing a formal relationship between HATC and PEFP

- CSNS : China Spallation Neutron Source
- HATC : Hadron Application and Technology Center at Tsinghua Univ

## ***II. Collaboration between Japan and Korea***

### **1. Technical Cooperation on Accelerator & Conventional Facilities Construction**

- Date : Oct. 12, 2009
- Place : PEFP Gyeongju Office
- Visitor from JAEA : Dr. Nobuo Ouchi
- Agenda: Development of conventional facilities construction
  - ▶ Design & construction of conventional facilities
  - ▶ Radio-waste water treatment dystem
  - ▶ Radiation safety & related technology

# The 7th WAO Workshop



## The 7th International Workshop on Accelerator Operations

Date : 12 ~ 16 April, 2010  
Place : KAERI, Daejeon, Korea  
Topics : Operations, Commissioning, Automation & Tools, Ergonomics & Control, Training, Maintenance, Safety & Regulations, Reliability, etc.  
Homepage: <http://wao10.komac.re.kr>  
Host : PAL/POSTECH and PEFP/KAERI

The 7th International Workshop on Accelerator Operations

WAO 2010 Daejeon

**Program Committee :**  
Roger Bailey, CERN  
Michael Bieler, DESY  
Rick Bloemhard, LBL  
Yong-Sub Cho, PEFP  
Jinhyuk Choi, PAL  
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Mike Stanek, SLAC  
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Violeta Toma, TRIUMF  
Wenzhi Zhang, SSRF  
Jijiu Zhao, IHEP

**Topics :**  
How We Do Business  
Commissioning  
Automation & Tools  
Ergonomics & Control Room  
Training  
Maintenance  
Safety & Regulation  
Reliability

**April 12 - 16 INTEC**

Hosted by : Pohang Accelerator Laboratory  
 Pohang University of Science and Technology  
 KOREA ATOMIC Energy Research Institute  
 Proton Engineering Frontier Project

**WAO 2010**  
Particle Engineering Frontiers Program  
April 12-16, 2010

**Local Program Committee :**  
Yong-Sub Cho, Jin-Hyuk Choi, Wan-Hong Jong, Mon Kim, Jun-Yeon Kim, Yu-Seok Kim, Byung-Cheol Lee, Young-Ouk Lee

**Local Organizing Committee :**  
Eun-Mi An, Yong-Sub Cho, Jin-Hyuk Choi, Jo-Ho Jang, Jun-Yeon Kim, Kul-Young Kim, Kye-Ryung Kim, Hyeok-Jung Kwon, Bum-Sik Park, Jae-Mon Park, Young-Gi Song

- It will be a great gathering to share experiences acquired from accelerator operations, commissioning, and so on.

- Participation from Asian country are strongly encouraged!

# Summary

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- The working group has activated vital communication and practical collaborations among member countries with great contributions from leading countries.
- We hope that the activities can greatly support HPPA programs in member countries.
- We will keep collaboration through personnel exchanges, regular workshops, technical mini-workshops and even exchanges of software, materials and equipments.