

International collaboration under the three-way framework agreement between the APS, ESRF and SPring-8

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3rd joint APS--ESRF-SPring-8 workshop was held at SPring-8 on April 15 and 16, 1996 based on the three-way Framework Agreement between these three facilities. More than 50 members were participated to the workshop.

This agreement signed in May 1993 in Grenoble. The purpose of the agreement is to foster international scientific collaboration among the three third generation synchrotron radiation institutions, to combine the expertise from each institution to accomplish unique scientific goals, and to develop and use specialized knowledge and facilities on an international basis. Mode of collaboration approved in the Agreement are, annual technical workshops, exchange of scientific personnel, exchange of technical information, and R&D projects on various subjects such as accelerators, insertion devices, beamline components, optics, detectors, and so forth.

The 1st workshop based on this agreement was scheduled on January 1994 in ESRF and these three-way collaborations in 1994-1995 have focused on four areas; beam position monitors(BPM's), particle orbit control methodologies, small-gap vacuum chambers, and high heat load optics.

At 2nd workshop on May 8-9, 1995 in APS, progress in each of these four areas of collaborations was discussed and future collaborations in 1995-1996 have been identified for the accelerators, insertion devices and beamline component areas. The following two proposals were made as high priority for development into three-way collaboration; (1)

installation of a SPring-8 undulator with variable-gap chamber in the ESRF storage ring for testing, and (2) installation of bellows with flexible RF shields in the ESRF storage ring for testing.

At 3rd workshop, progress in accelerators, insertion devices, optics, detectors and beamline program was discussed. The followings are summary of the workshop and some proposals are discussed as three-way collaboration in the coming year. The next workshop is scheduled on February, 1997 in Grenoble.

(1) accelerators

- RF-BPMs and COD correction were successfully tested at ESRF using a prototype RF-BPM of APS.
- APS algorithm SVD (Single Value Decomposition) for the COD correction is useful and adopted at ESRF.
- X-ray BPMs were developed using CVD diamond, which are not yet satisfactory, but promising. Especially, Smart XBPMs developed at APS are interesting.
- RF liners or RF contacts at bellows were successfully tested at ESRF using sock type liners developed at APS.
- Diagnostics using synchrotron radiation: Visible and UV light is useful to see the time structure and cleanliness of single bunched beam, but limited for emittance measurement because of the diffraction limit.

X-ray pinhole method is working for the on-line measurement of the emittance at ESRF, and will be installed at APS.\

More elaborated version is planned at SPring-8. Uniform procedure of data analysis was suggested to measure and compare the brilliance at three institutions.

- Correction of nonlinear resonances and coupling needs more detailed investigation. Collaboration to be developed.
- Longitudinal instabilities and cure: Coupled bunch instability caused by HOMs and bunch lengthening and widening caused by impedance, especially by RF liners, should be investigated further.
- Prospective R&D in view of the 4th generation light sources should be performed, especially in regard to the possibilities of SASE being envisaged at APS and SPring-8.
- Topping-off operation is to be tested at APS and ESRF.
- Radiation dose received by IDs need a long term survey.

(2) insertion devices

- SPring-8 tests of the in-vacuum ID at ESRF. APS participates in the test.
- APS develops and builds the magnetic measurement bench for SPring-8.
- ESRF,APS and SPring-8 share and exchange the information on the radiation pattern in SR tunnel and effects of radiation damage of IDs.
- SPring-8,ESRF and APS share and exchange the information on magnetic measurement techniques for helical undulators.

(3) beamline components/optics

- Information exchange for polished Be windows to get high quality coherent X-ray.
- Standardized measurement for beam properties

(flux,brilliance,coherence)

- Feasibility study of robots use on beamline: handling of samples, of image plates.
- SPring-8 progresses synthesis of diamond single crystals.
- SPring-8 develops <011>-grown FZ silicon.
- APS provides the in-situ mirror test station.

(4) X-BPMs

- Cooperation for in-situ tests at all institutions
- SPring-8 will test CVD diamond XBPM at ESRF and APS

(5) detectors

- Joint testing and evaluation of CCD based X-ray detectors on ESRF beamline
- Access to ESRF 'know-how' on production of high resolution scintillation screens
- Consideration of ESRF data-acquisition electronics for the SPring-8 "M-CCDX" detector

Participants list from APS and ESRF

<u>APS</u>	<u>ESRF</u>
D.Moncton	Y.Petroff
G.Shenoy	J-L.Laclare
Y.Cho	C.I.Branden
J.Galayda	G.Marot
E.Gluskin	E.Ziegler
J.Jones	J.Morse
S.Kim	B.Pulford
T.Kuzay	S.Wakatsuki
D.Mills	J.M.Filhol
M.Borland	P.Elleaume
D.Shu	
S.Sinha	
A.Lumpkin	
W.Yun	

3rd joint APS-ESRF-SPring-8 workshop
 April 15 and 16, 1996
 program

Monday, April 15Overview

SPring-8	H.Kamitsubo
APS	D.Moncton
ESRF	Y.Petroff

Accelerators

APS	
APS commissioning status and technique	M.Borland
Orbit stability measurements at APS	S.Kim
APS beam size measurements	A.Lumpkin
RF BPM performance data from APS	A.Lumpkin
APS bellows heating tests at ESRF	J.Jones

ESRF	
ESRF source performance objectives	J.L.Laclare
Machine operation at ESRF	J.M.Filhol
SPring-8	
Status of Spring-8	N.Kumagai
Calibration procedure for RFBPM at SPring-8	S.Sasaki
Emittance measurement with an X-ray pinhole array	S.Takano
Backward Compton scattering at SPring-8 to generate high energy gamma rays	S.Date

Insertion Devices

APS	
Performance of undulators at the APS	E.Gluskin
ESRF	
ESRF performances	P.Elleaume
SPring-8	
Status of the SPring-8	H.Kitamura

Tuesday, April 16Beamlines/Optics/Detectors development

APS	
Update on tests of internally cooled Si monochromator crystals using liquid nitrogen	D.Mills
X-BPM development at APS and results of tests performed at ESRF	T.Kuzay
ESRF	
Beamline engineering ESRF	G.Marot
Optics	E.Ziegler
Detectors	J.Morse
SPring-8	
SPring-8-Sumitomo collaboration on synthetic diamond crystals	T.Ishikawa
X-BPM	H.Aoyagi
Two dimensional detector	M.Suzuki

Beamline program

APS	G.Shenoy
ESRF	C.Branden
SPring-8	
Beamline program in Spring-8	T.Ueki
Soft X-ray spectroscopy in solid	S.Suga
High energy inelastic scattering	N.Sakai
RIKEN beamline	M.Yamamoto
JAERI beamline	A.Yokoya

Summaries/Further collaboration/Open discussion

Accelerators
Insertion devices
Beamline components/ optics/detectors
Others