

ICANS-XV  
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**4.4**

**A Report of the Working Group Session on Neutron Optics and Devices**

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A working group session on neutron optics and devices was held in parallel with other 5 working sessions. A total of 26 attendees participated in enthusiastic discussion. Four areas: magnetic-field gradient based devices, material lenses and prisms, spin flippers and polarizers, and reflective devices (mirrors, benders, etc.) were discussed, each led by a discussion leader.

**• Magnetic-field gradient based devices**

Hirohiko Shimizu (RIKEN) presented an overview of R&D activities of neutron optics at RIKEN. Work has been concentrated on the sextupole magnet focusing lens and the quadrupole magnetic refractive prism, mainly for cold neutrons application. A status report, including test results on both devices using neutron beams at a reactor, was given. Future directions include more evaluations especially in time-of-flight modes and upgrade to employing superconducting magnets.

**• Materials lenses and prisms**

Takayuki Oku (RIKEN) showed the performance of a compound refractive lens made of silicon dioxide as a focusing device. The present limitations in fabrication techniques and material constraints were discussed. He presented some conceptual design of beamline optics using various lenses for spin-echo small-angle scattering application.

**• Spin flippers and polarizers**

Frank Klose (SNS) showed the design of the supermirror guide for a reflectometer to be built at SNS and stressed the importance of mirror performance with respect to the overall capability of the instrument. He introduced a Drabkin flipper device to be installed in an upstream section of the guide, serving as a pulse sharpener/filter for polarized neutrons so as to improve the resolution of the reflectometer. A prototype device exists already and will be tested at IPNS in 2001. Some discussions were raised for possible modification of the device for unpolarized neutron applications.

• **Reflective devices (mirrors, bender, etc.)**

Yuji Kawabata (Kyoto Reactor Institute) presented the activities in development of supermirrors in Kyoto. He also showed plans of fabrication of mirrors at a new facility in collaboration with RIKEN.

The group agreed to take follow-up actions:

1. Establish a network of communication, discussion and information exchange using email.  
Anyone interested in neutron optics is welcome to join.
2. Set up a website (or interlinked websites) for information regarding neutron optics.
3. Continue cooperation for R&D activities such as joint efforts in fabrication and testing of optics devices between various institutions.
4. At opportune moments, organize focused workshops or topical meetings.

The volunteered coordinators for the above actions are:

"Hirohiko Shimizu" <shimizu@riken.go.jp>

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Currently we have a mailing list of over 60 people. Feel free to contact any of the coordinators if you are interested.