Novel accelerator driven CANS sources in Japan and Germany – from transportable sources for bridge maintenance to highly brilliant user facilities

In June 2024, the representatives of the Japanese and German neutron society met at research centre Jülich: Dr. Yoshie Otake, Team Leader of the Neutron Beam Technology Team at RIKEN Center for Advanced Photonics (RAP) in Japan and Prof. Mirijam Zobel, RWTH Aachen University in Germany.

They exchanged on the width of possibilities which open up by the development of compact accelerator driven neutron sources (CANS) in Japan and Germany.

RIKEN has a strong track record in CANS with small-scale sources. Neutron scattering experiments such as engineering diffraction, PGAA, imaging, and SANS are carried out at two accelerator-based CANS, named RANS (7 Mev Proton, Be(p,n)) and RANS-II (2.49 MeV Proton Li(P,n)). Recently, RIKEN drives the realization of a transportable neutron source system for outdoor use that can be used for non-destructive measurement of infrastructure such as bridges and highways to prevent accidents by material failure. Such a transportable CANS source perfectly showcases the industrial and societal needs for neutrons in material research and characterization.

The Jülich Centre for Neutron Science (JCNS), on the contrary, excels in the development of so called high-current CANS (HiCANS) sources like the High Brilliance Neutron Source (HBS), which could host 25 instruments as a user facility on three target stations in Germany.

The Japanese and German representatives are looking forward to future exchange and collaboration on the CANS topic and between the neutron societies.

Riken CANS website: https://rans.riken.jp/index-e.html

Recent development on transportable neutron systems: https://www.tandfonline.com/doi/full/10.1080/10619127.2023.2198914

HBS website: https://hbs.fz-juelich.de/