Contribution ID: **51** Type: **Contributed Oral**

The High-Brilliance Neutron Source Project

Tuesday, 25 February 2025 12:10 (20 minutes)

Accelerator-driven neutron sources provide a cost-efficient and attractive alternative to present neutron sources like fission reactors and spallation sources. With the advent of high-current proton accelerator systems, a novel class of such neutron facilities emerged termed High-Current Accelerator-driven Neutron Sources (HiCANS) with unique properties and possibilities.>

The High Brilliance neutron Source project (HBS) at the Forschungszentrum Jülich develops such a HiCANS facility. It utilizes a 70 MeV and 100 mA pulsed proton linear accelerator providing tailored proton pulses with frequencies of 24 Hz or 96 Hz up to three optimized target stations. These target stations are compact in comparison to spallation neutron sources due to the low energy nuclear reactions releasing neutrons from a high-power tantalum target. It allows for an efficient neutron production, moderation and extraction and, thus allowing competitive neutron instrument performances.

A detailed Technical Design Report (TDR) has been published, describing all relevant components from accelerator, target, moderators to instruments. It shows a potential national neutron source facility with up to 24 instruments for all kinds of applications. A target station prototype was built at a 45 MeV cyclotron and brought into operation with first neutrons December 2022. Experiments performed demonstrated the accessibility and flexibility of this new type of source, and the expected performance could be evaluated.

We will present the current status of the High-Brilliance Neutron Source (HBS) HiCANS project as well as the next steps and milestones for this next generation neutron source.

Email Address

Email Address

Presenter if not the submitter of this abstract

Funding Agency

Abstract classification - track type

Future of CANS

Primary authors: MAHARAJ, Dalini (Forschungszentrum Jülich); SHABANI, Doruntin (Forschungszentrum Jülich GmbH); MONIA, El Barbari (Forschungszentrum Jülich GmbH); MAUERHOFER, Eric (Forschungszentrum Jülich GmbH); PODLECH, Holger (Goethe University Frankfurt); LI, Jingjing (JCNS-2, Forschungszentrum Jülich); CHEN, Junyang (Forschungszentrum Jülich GmbH); VOIGT, Jörg (Forschungszentrum Jülich GmbH); LIEUTENANT, Klaus (Forschungszentrum Jülich GmbH); SCHMIDT, Norberto (Forschungszentrum Jülich GmbH); ZAKALEK, Paul (Forschungszentrum Jülich GmbH); BOSSERHOFF, Theresa (Forschungszentrum Jülich GmbH); GUTBERLET, Thomas (Forschungszentrum Jülich); RÜCKER, Ulrich (JCNS-2, Forschungszentrum Jülich)

Presenter: ZAKALEK, Paul (Forschungszentrum Jülich GmbH)

Session Classification: Session 4