

The Jülich High-Brilliance Neutron Source Project

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Accelerator driven neutron sources provide a cost-efficient and attractive alternative to classical neutron sources like fission reactors and spallation sources. With the advent of high current proton accelerator systems, a novel class of such neutron facilities can be established termed High-Current Accelerator-driven Neutron Sources (HiCANS). Such sources can counteract the increasing shutdown of existing fission-based neutron sources and a decline in available neutron beam days in Europe.

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. Due to the low energy nuclear reactions releasing neutrons from a high-power tantalum target, the target stations are compact in comparison to spallation neutron sources. It allows for an efficient neutron production, moderation and extraction and thus allowing competitive neutron instrument performances.

A detailed technical design report describing all relevant components ranging from accelerator, target, moderators up to the instruments was published recently. It shows a potential national neutron source facility with up to 24 instruments for all kinds of applications.

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