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ESTABLISHING A NEW CLASS OF HIGH-CURRENT ACCELERATOR-DRIVEN NEUTRON SOURCES WITH THE HBS PROJECT

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Accelerator-driven high brilliance neutron sources are an attractive alternative to the classical neutron sources of fission reactors and spallation sources to provide scientists with neutrons. A new class of such neutron facilities has been established referred to as High-Current Accelerator-driven Neutron Sources (HiCANS). The basic features of HiCANS are a medium-energy proton accelerator with of tens of MeV and up to 100 mA beam current, a compact neutron production and moderator unit and an optimized neutron transport system to provide a full suite of high performance, fast, epithermal, thermal and cold neutron instruments.

The Jülich Centre for Neutron Science (JCNS) has established a project to develop, design and demonstrate such a novel accelerator-driven facility termed High Brilliance neutron Source (HBS). The aim of the project is to build a versatile neutron source as a user facility. Embedded in an international collaboration, the HBS project offers the best flexible solutions for scientific and industrial users. The overall conceptual and technical design of the HBS as a blueprint for the HiCANS facility has been published in a series of recent reports.

The status and next steps of the project will be presented, focusing on the high-current linear accelerator and the proton beamline, including a novel multiplexer to distribute the proton beam to three different neutron target stations while adapting a flexible pulse structure.

Footnotes

Technical Design Report HBS Volume 1 –Accelerator 2023, Forschungszentrum Jülich GmbH Zentralbibliothek, Verlag Jülich, ISBN: 978-3-95806-709-7, <https://juser.fz-juelich.de/record/1016730>

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