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The High Brilliance Neutron Source Target Stations

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The advent of high-current accelerator systems launched the development of high-current accelerator-driven neutron sources (HiCANS) utilizing low energy nuclear reactions. This development can counteract the increasing shutdown of existing fission-based neutron sources and a resulting decline in available neutron beam days as well as establishing HiCANS as a next generation national neutron source.

A main component of a HiCANS is the target station used to release neutrons, to moderate the neutrons to the required energy in the keV or meV range, to extract the neutrons to the instruments with the proper phase space volume as well as to shield the surrounding equipment. Within the High-Brilliance neutron Source (HBS) project, three target stations will be operated simultaneously with one long pulse, and two medium pulse proton beams. The target stations have target / moderator / reflector geometries optimized to the specific proton beam structure resulting in tailored neutron beams for different groups of neutron instruments.

At the ECNS conference, we will present the general design ideas of such HiCANS target stations, show the flexibility they offer and present the resulting TMR assemblies for the HBS project.

This work is part of the collaboration within ELENA and LENS on the development of HiCANS.

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