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# High performance target for an accelerator driven neutron source

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The target development for compact accelerator driven neutron sources (CANS) for low energy and high current ion beams started to gain more attention with the upcoming high-brilliance neutron source (HBS) project and the SONATE project. It is in a similar state where the development for fission and spallation targets has been decades ago, namely fast changing and still with a large optimization potential.

The neutrons for a CANS are produced by nuclear reactions of light ions like protons or deuterons in the low MeV-range in a suitable target material. The cross sections for the neutron production depend on the particle energy, the particle type and the target material. For energies in the 10 MeV range, low Z-materials like lithium or beryllium (LENS, RIKEN) are generally used due to the high neutron yield. But by increasing the ion energy above 30 MeV, the performance of high Z-materials is improving and other target materials are becoming more favorable like tungsten or tantalum.

Within the HBS project we started to develop a high performance tantalum target for a 70 MeV proton beam and an average power of 100 kW. The choice of material and the target design circumvents many problems commonly used beryllium targets have. At the workshop on Efficient Neutron Sources, we will present the material and design choices we made for a high performance tantalum target.

## Poster back-up

Yes

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