



The neutron source system proposal for the ARGITU project

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High-current accelerator-driven neutron sources (HiCANS) [2] claim to cover the gap of neutron production in Europe created by the shutdown of research reactors. The ARGITU project is one of these initiatives to build a regional neutron source in the Basque Country area (Spain).

In this work, a view of the proposed facility focused on accelerator and target will be given. The accelerator is based on ESS-Bilbao ion source facility that will be upgraded with the completion of the RFQ (already on manufacturing phase) and new DTL tanks to achieve 31.5 MeV of final energy.

The proton beam will target a beryllium plate cooled with water. The relative low energy of the protons minimizes the shielding requirements and thus, it allows to reduce the size of the Target station up to 2 m in diameter. The relative compact dimensions of the as well as the use of low activation materials will minimize the requirements on services like remote handling, lifting devices, cooling supply etc.

Finally, the ARGITU cold and thermal moderators will be based on HBS 1-D proposal/concept (la que preferias) [3]. The 1-D moderator proposal optimizes the coupling between target, moderator, premoderator and reflector and thus increase the efficiency of the complete moderation process. This highly efficient coupling will partially compensate the reduced efficiency of the neutron production reaction (p,Be) giving a final moderator brightness comparable with mayor facilities in Europe.

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

References

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