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A proposal of the neutron instrument suite of ARGITU, the high-current accelerator-driven neutron source in the Basque Country

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The ARGITU project is one of the initiatives framed within the joint European strategy to develop the next generation of high-current accelerator-driven neutron sources (HiCANS). In this envisioned facility, a high current proton beam ($E=31.5$ MeV) hits a beryllium target, producing neutrons by nuclear processes that can serve to run a suite of up to four neutron scattering instruments per target station.

In this work, a proposal for a potential neutron scattering instrument suite for the ARGITU facility is presented. The long pulse delivered by ARGITU ($\tau = 1.5$ ms) can be fully exploited by not only the instruments with relaxed energy resolution, but also to the high-resolution instruments. Up-to-date neutron optical developments, dedicated moderators for each instrument, and other state-of-the-art compact devices will help to give shape to the conceptual design of the scientific instruments around the compact neutron source. The eventual selection of instruments will be done in close collaboration with the local scientific community, prioritizing the neutron scattering techniques that will provide more impact to the community, and exploring the different possibilities of this new infrastructure, to support high-level research and development, education, and as an integral part of wider experimental campaigns within long-term collaborations with large-scale European and international neutron facilities, such as ESS, ILL ISIS and MLZ.

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

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