

The Design Study of the Target Station for the ESS Neutrino Super Beam Project

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The ESSnuSB project proposes the production of a European neutrino Super Beam for the discovery of the CP symmetry violation in the leptonic sector. For this purpose, an upgrade is under design of the 5 MW, 2 GeV proton beam from the LINAC of the European Spallation Source, currently under construction in Lund (Sweden), to obtain an additional 5 MW power beam dedicated to the neutrino production, without therefore reducing the neutron production efficiency. The additional proton beam will be then directed to an accumulator and split through a switchyard in four beams, each of 1.25 MW power. The secondary beam will be delivered to a target station consisting of four target-horn collectors, a decay tunnel, and a beam dump. A dedicated design study of the Target Station is required to optimize the lifetime of the horn, regarding mechanical and thermal constraints, and the CP sensitivity of the experiment. The current status of this design study is here presented. This project is supported by a COST Action and an EU H2020 Design Study.

Working Group

WG3 : Accelerator Physics

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