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The ESSnuSB High Intensity Neutrino Super Beam

Thursday, 7 July 2022 16:00 (15 minutes)

The measurement of the matter/antimatter asymmetry in the leptonic sector is one of the highest priority of the particle physics community in the next decades. The ESSnuSB collaboration proposes to design a long baseline experiment based on the European Spallation Source (ESS) at Lund in Sweden. This experiment will be able to measure the Δ_{CP} parameter with an unprecedented sensitivity thanks to a very intense neutrino superbeam and to the observation of the ν_{μ} to ν_{e} oscillation at the second oscillation maximum. To reach this goal, the ESS facility will be upgraded to provide an additional 5 MW proton beam by doubling the LINAC pulse frequency from 14 Hz to 28 Hz. The pulse time width will be reduced thanks to an accumulator ring from 2.86 ms to 1.3 microseconds and shared in four parts by a beam switchyard before entering into the target station. The produced neutrino superbeam will be sent to a large 538kt fiducial mass Far Detector based on Water Cherenkov technology.

In this talk, a global overview of the project with its physics potentials will be reviewed and additional possibilities offered by this high intensity facility for complementary R&D activities will also be discussed.

In-person participation

Yes

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