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Long baseline neutrino project in Europe: ESSnuSB project

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ESSnuSB is a design study for a long-baseline neutrino experiment to precisely measure the CP violation in the leptonic sector, at the second neutrino oscillation maximum, using a beam driven by the uniquely powerful ESS linear accelerator. The ESSnuSB CDR showed that after 10 years, about 72% of the possible CP-violating phase, δCP, range will be covered with 5σ C.L. to reject the no-CP-violation hypothesis. The expected precision for δCP is better than 8° for all δCP values, making it the most precise proposed experiment in the field. The recently started extension project, the ESSnuSB+, aims in designing two new facilities, a Low Energy nuSTORM and a Low Energy Monitored Neutrino Beam to use them to precisely measure the neutrino-nucleus cross-section in the energy range of 0.2 −0.6 GeV. A new water Cherenkov detector will also be designed to measure cross sections and serve to explore the sterile neutrino case. An overall status of the project will be presented together with the ESSnuSB+ additions.

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