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The European Spallation Source neutrino Super Beam project

The value of the neutrino mixing angle θ_{13} privileges the second oscillation maximum for the discovery of CP violation instead of the first one. Going to the second oscillation maximum necessitates very intense neutrino beams with the appropriate energy. The most intense neutron source, the ESS, will have a 2GeV proton linac with the unprecedented power of 5MW. This linac also can produce the most intense neutrino beam with very high potential to discover and measure a neutrino CP violation. The physics performance of that neutrino beam combined with a megaton Water Cherenkov detector installed at a distance of 500km from ESS has been evaluated. In addition, the choice of such detector will extend the physics program to proton-decay, atmospheric neutrinos and astrophysics searches. This facility will also produce at the same time a copious number of muons which could be used by other facilities as a muon collider.

Mini-abstract

The ESSnuSB project will try to discover CP violation using the 2nd neutrino oscillation maximum.

Experiment/Collaboration

ESSnuSB

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