

Status of the ESS ν SB Target Station

In the quest of the CP-violation in the leptonic sector, a crucial information obtained from reactor experiments; demonstrating that the value of the third neutrino-mixing angle, θ_{13} , is higher than its previously defined standard value. In the light of this new finding, an urgent need raised to improve the detection sensitivity of the current long-baseline detectors, with a key modification to place the far detectors at the second, rather than the first, oscillation maximum.

The European Spallation Source Neutrino Super Beam (ESS ν SB) aims at searching for CP-violation in the leptonic sector, at 5σ significance level in more than 60% of the leptonic Dirac CP violating phase range, and measure the CP phase angle with high precision by setting the neutrino source-to-detector distance, the baseline, at the second oscillation maximum. Several technological challenges must be precisely studied and simulated before addressing the design of the ESS ν SB detector. Among these, the finite element and physics simulations of the target station and the neutrino beam considered highest priority at this phase of the ESS ν SB project.

Here I will shed light on the current target station design physics and FEA simulation efforts of the ESS ν SB WP4 working group.