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## Optimization of the Target Station for the ESSnuSB Project Using the Genetic Algorithm

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The ESS neutrino Super Beam project (ESS $\nu$ SB) aims at the production of an intense neutrino beam by using the 5 MW average power proton beam from the ESS facility currently under construction in Lund (Sweden). In the present work, we show the results of the Genetic Algorithm applied to the design of the ESS $\nu$ SB target station. The impact of this optimization method on the physics reach of the experiment, especially on the precision which can be achieved in the measurement of the neutrino oscillation CP-violating phase  $\delta_{CP}$ , is discussed. The ESS $\nu$ SB project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 777419.

### Collaboration name

ESSnuSB

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