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The ENUBET beamline

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The ENUBET project aims at reducing the flux related systematics on a narrow band neutrino beam through the monitoring of the associated charged leptons in an instrumented decay tunnel.
A key element of the project is the design of a meson transfer line with conventional magnets that maximizes the yield of K^+ and π^+, while minimizing the total length to reduce meson decays in the not instrumented region. In order to limit particle rates on the tunnel instrumentation, a high level of beam collimation is needed, thus allowing undecayed mesons to reach the end of the tunnel. At the same time a fine tuning of the shielding and the collimators is required to minimize any beam induced background in the decay region. The transfer line is optimized with TRANSPORT and G4beamline simulations for 8.5 GeV/c mesons with a momentum bite of 10%, considering various proton drivers and target designs.
This contribution reports details on the current envisaged beamline with and improved proton target design. Highlights of a full GEANT4 simulation of the setup in terms of particle yields and expected neutrino fluxes at the far detector will be shown, together with doses estimation through a FLUKA simulation.

Collaboration name

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