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Decay tunnel instrumentation for the ENUBET neutrino beam

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Future neutrino experiments require measurements of absolute neutrino cross section at the GeV scale with a precision of 1% which nowadays is limited by the uncertainties on neutrino fluxes. The aim of the ENUBET project is to measure the neutrino flux by monitoring positrons from $K^+ \to \nu_e\ e^+\ \pi^0$ decays on an event by event basis. For this purpose a calorimeter system to instrument the decay tunnel of a narrow band neutrino beam has been proposed. The technology is based on modules of Fe/Scintillators shashlik calorimeters longitudinally segmented and readout by Silicon PhotoMultipliers to separate $e^+/\pi^\pm/\mu$ with $17\%/\sqrt{E}$ energy resolution. The system includes also a photon veto made of plastic scintillator tiles to tag positrons coming from kaon decays discarding events with e^+e^- pairs produced in photon conversion from π^0. Performances of calorimeter and photon veto prototypes will be reported together with simulation studies of the beam line.

Collaboration name

ENUBET

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