

The Demonstrator: a large scale prototype of the instrumented decay tunnel for the ENUBET monitored neutrino beam

The NP06/ENUBET project is designing a facility with unprecedented control on the neutrino flux for high precision ($O(1\%)$) cross section measurements. The key part of the facility is an instrumented decay tunnel that measures large angle charged leptons from kaon decays, thus constraining the associated neutrino fluxes. It is based on a sampling calorimeter for $e/\mu/\pi$ separation and on rings of plastic scintillators in the inner part of the calorimeter for the rejection of photons coming from π^0 . An intense prototyping activity led to the final configuration of the calorimeter readout: WLS fibers running on the frontal faces of the tiles bring the light to SiPMs placed above a borated polyethylene layer, providing a shielding against radiation damage of the sensors. A 1.65 m long section of the instrumentation with 400 active channels has been built to demonstrate the viability and effectiveness of this approach and it was tested in the renovated East Area at CERN-PS in October 2022. An extension of the instrumented region of the Demonstrator, with the addition of 875 channels, is on going to increase its acceptance and the newly equipped detector will be exposed again at the PS in August 2023. This contribution will report a summary of the prototyping activities, an overview of the Demonstrator design and construction and results of the test beam campaigns.