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The MICE beamline PID instrumentation for a precise emittance measurement

The International Muon Ionization Cooling Experiment (MICE) will carry out a systematic investigation of ionization cooling of a muon beam, for the future Neutrino Factory and the Muon Collider. As the emittance measurement will be done on a particle-by-particle basis, a sophisticated beam instrumentation is needed to measure both particle coordinates and timing vs RF in a harsh environment due to high particle rates, fringe magnetic fields and RF backgrounds. A PID system, based on three x/y time-of-flight stations (with resolutions around 50 ps), two Aerogel Cerenkov counters and a KLOE-like calorimeter (KL) has been constructed and has allowed the commissioning of the MICE muon beamline. PID detector performances will be shown and their use for a preliminary estimate of the beamline emittance and the MICE muon beam pion contamination will be illustrated.

quote your primary experiment

MICE

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