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Layout of the MICE Demonstration of Muon Ionization Cooling

Muon beams of low emittance provide the basis for the intense, wellcharacterised
neutrino beams necessary to elucidate the physics of flavour at the
Neutrino Factory and to provide leptonantilepton
collisions up to several TeV at the Muon Collider. The international Muon Ionization Cooling Experiment (MICE) will demonstrate muon ionization cooling, the technique proposed to reduce the phasespace
volume occupied by the muon beam at such facilities.
In an ionizationcooling
channel, the muon beam traverses a material (the absorber) loosing energy, which is replaced using RF cavities. The combined
effect is to reduce the transverse emittance of the beam (transverse cooling). The configuration of MICE required to deliver the demonstration of ionization
cooling is presently being prepared in parallel to the execution of a programme designed to measure the cooling properties of liquidhydrogen
and lithium
hydride (Step IV). The design of this final cooling demonstration will be presented together with a summary of the performance of each of its components
and the cooling performance of the experiment.

Experimental Collaboration

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