Contribution ID: **82** Type: **Talk: in-person**

Update on the design of the 6D Muon Cooling Demonstrator

Tuesday, 17 September 2024 16:15 (20 minutes)

The muon collider is an excellent prospect as a multi-TeV lepton collider, with the possibility for high luminosity and reach to 10 TeV centre-of-mass energy per parton. In order to realise high luminosity, high beam brightness is required. Ionisation cooling, which was demonstrated recently by the Muon Ionization Cooling Experiment (MICE), is the technique proposed to realise sufficient brightness. MICE demonstrated transverse emittance reduction of incident beams having relatively high emittance and without beam reacceleration. The international Muon Collider Collaboration proposes a Demonstrator for Muon Cooling that will demonstrate six-dimensional emittance reduction over a number of cooling cells, operating at beam emittance close to the ultimate goal for the muon collider 6D cooling system. Together with a full R&D programme, this will pave the way for construction of a muon collider. In this paper, the latest developments in the Demonstrator design will be discussed, considering integration of requirements and constraints from beam physics, solenoid and RF cavity design, absorbers and windows.

Working Group

WG 3: Accelerator Physics

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Session Classification: Parallel: WG 3x4

Track Classification: WG3: Accelerator Physics