

The Muon Collider: a challenge for the future

Thursday, June 8, 2023 4:55 PM (25 minutes)

The future of high energy physics relies on the capability of exploring a broader energy range than current accelerators, with higher statistics. A muon collider combines the great precision of electron-positron machines, with a low level of beamstrahlung and synchrotron radiation, and the high center-of-mass energy and luminosity of hadron colliders.

For these reasons, studies aimed at designing a muon collider able to reach 10+ TeV center-of-mass energies with luminosity higher than $10^{34} \text{ cm}^{-2}\text{s}^{-1}$ are currently ongoing. These operational conditions open an unprecedented physics program, which ranges from precision studies of the Higgs boson to Beyond Standard Model (BSM) searches.

Among the technological challenges, the ability to produce collimated beams of unstable particles, the muons, for a period long enough to allow high luminosity collisions, together with the treatment of the Beam-Induced Background (BIB) are the most critical issues for the detector design.

This contribution will present the status of the detector design and will discuss the expected reach of the most representative physics processes.

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Session Classification: New facilities

Track Classification: New facilities