

# Detector performance for low- and high-momentum particles in $\sqrt{s} = 10$ TeV muon collisions

*Saturday 20 July 2024 17:53 (17 minutes)*

A 10 TeV muon collider is the ideal machine to explore the energy frontier. In addition to producing large samples of Standard Model particles, it has the potential to create new, possibly massive states, enabling a broad physics program that includes direct and indirect searches for new physics, precise Standard Model measurements in an unexplored energy regime, and significant advancements in the Higgs sector.

The fulfillment of such physics potential lies in the detector's ability to reconstruct physics objects and measure their properties over a wide range of momenta at high levels of beam-induced background. At 10 TeV collisions, the transverse momenta of Standard Model particles are relatively low, while new heavy states are expected to decay into high-momentum central physics objects.

This contribution presents a possible detector design and the reconstruction performance of the main physics objects using a detailed detector simulation that includes the beam-induced background.

## Alternate track

### I read the instructions above

Yes

**Author:** CASARSA, Massimo (INFN, Trieste (IT))

**Presenter:** CASARSA, Massimo (INFN, Trieste (IT))

**Session Classification:** Detectors for Future Facilities, R&D, Novel Techniques

**Track Classification:** 13. Detectors for Future Facilities, R&D, Novel Techniques