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ECAL Calibration and Energy Resolution for a 10TeV Detector Geometry

In the pursuit of a muon collider operating at ~10 TeV center-of-mass-energy, designing a highly accurate and sensitive detector is crucial. Calorimetry plays a key part in any detector setup, as we rely on our calorimeters for energy reconstruction and particle identification. Therefore, an effective calorimeter must be extremely well-calibrated and achieve excellent resolution. This poster will report on efforts to achieve a comprehensive energy calibration of the electromagnetic calorimeter (ECAL) for our 10 TeV detector design. This calibration is necessary in order to achieve desired energy resolution for reconstructed photons across a wide range of energies (0-1TeV). We report on the challenges introduced by the new location of the solenoid in our latest 10 TeV detector design, the necessity of a calibration strategy that is both energy-dependent and angularly dependent, and the resulting effects on photon energy resolution.

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