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SÉMINAIRE DE PHYSIQUE CORPUSCULAIRE

SUJET: **Calorimetry in high energy and high intensity particle physics applications**

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RÉSUMÉ:

Calorimeters are the prevalent detector choice in particle physics experiments requiring precision energy and direction reconstruction for even the highest energy particles escaping an interaction. In this talk we briefly review the basic principles of signal generation and signal features for these detectors, and discuss their application at the world's highest energy and intensity hadron collider in operation today, the Large Hadron Collider (LHC) at CERN. Some emphasis is put on the reflection of the typical detector signal characteristics onto the methods applied to reconstruct the collision products and extract the underlying physics in an environment characterized by a significant background arising from diffuse lower energy particle flow surrounding the interaction of interest. The paramount examples guiding this part of the talk are the calorimeter systems and the corresponding reconstruction techniques employed by the two large multi-purpose experiments at the LHC, ATLAS and CMS. Additional considerations include a brief outlook on the application of calorimeters in the even more challenging environments of future lepton and hadron colliders, and their application in non-collider experiments at the intensity frontier, like MINOS and NOvA.