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Implementation, performance and physics impact of particle identification at Higgs factories

The particle physics community has concluded that the next collider should be an e+ e- Higgs factory. Such a collider would also enable many other precision measurements, e.g. of the top quark and in the electroweak sector, as well as searches for exotic particles. In the ongoing discussions it has become increasingly clear that particle identification including charged hadron ID is a key feature that enables a number of analyses and improves many. A number of different PID systems - from the simple muon ID to gaseous dE/dx and dN/dx to calorimeter shower shapes and time of flight (and more) - are being envisioned for the proposed future Higgs factory detector concepts, however the choices of technologies, their implementation in detector concepts and their physics impact are open questions under study.

This talk discusses the implementation of and performance measures for different PID technologies and their combination, based on the International Large Detector (ILD) as example of a detector concept optimised for particle-flow reconstruction. An overview of physics applications will be given, with a particular focus on the prospects for measuring the Higgs bosons decay to strange quarks.

Collaboration / Activity

ILD

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