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A detector for FCC-hh: Tracker & Vertex design and optimization

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The $\sqrt{s}=100$ TeV proton-proton collider (FCC-hh) is a core part of the Future Circular Collider project. The conceptual design of a suitable detector for FCC-hh is an integral part of this ongoing effort.

Such a detector should be able to operate under luminosities of up to 3x10^35 cm-2s-1, and pile-up conditions of up to ~1000 events per bunch crossing. In addition, the physics program includes signatures with highly boosted objects that create jets with very high track density and displaced secondary vertices far away from the interaction point. These conditions make particle tracking, vertex identification, and flavor tagging extremely challenging.

This talk presents a review of the general ideas and requirements that drive the current tracker and vertex detector design for FCC-hh, like detector granularity, material budget and pattern recognition. A special emphasis will be put on the reconstruction of boosted objects and the capability to identify heavy flavor jets.

Author: PEREZ CODINA, Estel (CERN)
Presenter: PEREZ CODINA, Estel (CERN)

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