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TIMING TRACKERS FOR HIGH LUMINOSITY HADRON COLLIDERS

The understanding of the Higgs properties, the measurements of triple and quartic boson-boson coupling, the study of the Higgs self coupling, and the search of new particles are strong Physics cases, pushing for a LHC upgrade both in energy and luminosity.

New concepts of on-line triggers must be developed in order to cope with the expected presence of hundreds pp collisions per bunch-crossing. The use of a time coincidence window between hits of the same sub-detector or of different sub-detectors much narrower than accelerator clock can strongly increase the rejection of fake coincidences.

Tracking layers with sub-nanosecond time resolution can meet the requirements.

Resistive Plate Chambers and Diamond Detectors are two important example of candidate detectors for “timing trackers”.

New front-end electronic technologies must be made available to the European high-energy research community such as SiGe BiCMOS chips and Vertical Integration Mixed technology in order to build timing trackers for high luminosity colliders.

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