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Trigger for LHC Run II and beyond

Thursday, 28 November 2013 14:00 (1 hour)

The LHC will provide the experiment an enormous amount of data to test the Standard Model and its extensions to an unprecedented precision level. The increase in energy to 14 TeV and the instantaneous luminosity to $2 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$ and beyond come at the price of an additional complexity of the events: LHC in 2015 is expected to deliver in average 40 collision per bunch, increasing to about 140 in Phase 2. The experiments need to update the DAQ and trigger system in order to maintain high efficiency in selecting interesting events, buried in extremely high background levels. The key point for efficient trigger selections is the suppression of the pileup contribution. A better use of the tracking information, able to identify the single collisions, as well as improvements in the detectors and their readouts is required. The use of modern computing solutions, as newer CPU or GPGPU, better networking systems and fast electronic processor, based on FPGA or Associative Memories, will allow to allow to win the challenge.

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