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The CDF II eXtremely Fast Tracker Upgrade

The CDF II eXtremely Fast Tracker (XFT) is the trigger processor which reconstructs charged particle tracks in the transverse plane of the central tracking chamber. The XFT tracks are also extrapolated to the electromagnetic calorimeter and muon chambers to generate trigger electron and muon candidates. The XFT is crucial for the entire CDF II physics program: it detects high p_T leptons from W/Z and heavy flavor decays and, in conjunction with the Level 2 processors, it identifies secondary vertices from beauty decays. The XFT has thus been crucial for the recent measurement of the $B_0^s - \bar{B}_0^s$ mixing and Σb discovery. The increase of the Tevatron instantaneous luminosity demanded an upgrade of the system to cope with the higher occupancy of the chamber. In the upgraded XFT, three dimensional tracking reduces the level of fake tracks and measures the longitudinal track parameters, which strongly reinforce the trigger selections. This allows to maintain the trigger perfectly efficient at the record luminosities $2 - 3 \cdot 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$ and to maintain intact the CDF II high luminosity physics program, which includes the Higgs search. The architecture, the used technology, the performance and the impact of the upgraded XFT on the entire CDF II trigger strategy are reviewed.

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