

Fast Timing Via Cerenkov Radiation

Wednesday, 5 August 2009 09:00 (20 minutes)

High precision timing will be a critical requirement for the next generation of particle detectors and high energy particle physics experiments. In particular, high precision timing will be essential for forward proton detectors in the FP420 research and development project. Collaborators behind the FP420 project have proposed the idea of positioning proton detectors 420m away from the CMS/ATLAS point of interactions. These detectors will serve as secondary detectors to tag protons scattered at very small angles with fractional longitudinal momentum loss of less than 2%. Detection of these forward protons is expected to open up new studies of Quantum Chromodynamics, Higgs Boson, electroweak and beyond the standard model physics. To associate scattered protons with their correct point of interaction, timing resolution on the order of a few picoseconds is needed. This talk will present a simulation study that explores the possibility of having detectors capable of picosecond timing.

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