

Fast timing measurement for CMS RPC Phase II upgrade

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With the increase of the LHC luminosity foreseen in the coming years many detectors currently used in the different LHC experiments will be dramatically impacted and some need to be replaced. The new ones should be capable to provide time information to reduce the data ambiguity due to the expected high pileup.

We propose to equip CMS high eta muon chambers with doublets of RPC detectors read out by long pickup strips PCB. The precise measurement ($<150\text{ps}$) of the signal induced by particles crossing the detector on both ends of each strip will give an accurate measurement of the position of the incoming particle along the strip. The absolute time measurement, determined by RPC signal (around 1 ns) will also reduce the data ambiguity due to the highly expected pileup and help to identify Heavy Scalar Charged Particles (HSCP).

Principle of the measurement, implementation in front-end electronic boards (Petiroc front-end ASIC, wave-union TDC and PCB design) will be presented associated with first results on prototype chambers.

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Session Classification: High Rate / New electronics