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A fast electronics for RPC based precision tracking muon trigger at high luminosity LHC

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Muon triggering at the super LHC luminosity imposes very strict requirements on the trigger concerning not only the rate capability but also to the tracking accuracy. This is particularly true for the very forward regions for which the LHC experiments are scheduling upgrade plans.

An accurate 3D tracking allows defining a sharp threshold in the muon transverse momentum. Moreover high resolution timing is crucial to reject as much as possible fake triggers generated by correlated and uncorrelated background.

We propose here a new trigger idea, exploiting the RPC sub-ns / sub-mm RPCs space-time resolution, based on a very fast multi channel front end circuit capable of selecting in few ns the maximum charge deposition among the input channels.

The fake triggers are heavily suppressed by means of a mean-timer based local coincidence circuit gating the readout.

We will present this electronics in terms of functionality and performance, supporting a detector design with a relatively low overall electronics complexity and cost with respect to other more conventional schemes.

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