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A fast precision tracking trigger with RPCs for high luminosity LHC upgrade

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Muon triggering at the s-LHC luminosity imposes very strict requirements on the trigger detectors concerning not only the rate capability but also to the tracking accuracy. Indeed an accurate 3D tracking allows both to define a sharp threshold in the muon transverse momentum and to efficiently reject the low energy uncorrelated background.

Moreover in order to be used for the first trigger level, this tracking must also be very fast.

We propose here a new trigger idea based on a very fast multi channel front end circuit, capable of selecting the maximum charge deposition among the input channels.

This circuit fully exploits the sub-ns / sub-mm RPCs space-time resolution, while keeping the overall electronics complexity and cost at low level with respect to other more conventional schemes.

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