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Development of a new front-end electronics in Si and SiGe technology for the Resistive Plate Chamber (RPC) detector for high rate experiments

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The Resistive Plate Chamber (RPC) detector front-end for high rate experiments is being developed. A mixed technology in Silicon and Silicon-Germanium is used in order to enhance its performances: a preamplifier in Silicon with a very low inner noise (1000 e- rms) and a new kind of discriminator in SiGe technology with a threshold of the order of 1 mV. The main feature of this new kind of front-end is the great ability to discriminate the signal from the noise with a minimum threshold of few femtoCoulomb. In this presentation the results of the simulation and the tests of the front-end will be shown, and the advantages and the huge rate capability gain that the RPC detector can achieve with this new front-end is discussed.

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