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## Detailed simulations for estimating time resolution of gaseous ionization detectors

HL-LHC and similar other high luminosity experiments demand detectors capable of providing timing resolution of 100s, or even 10s, of picoseconds in order to resolve the interactions and get rid of the background induced by pileup. While it is expected that fast detectors will have important applications in other fundamental and applied fields, the present study is motivated by the requirements of high rate particle physics experiments.

In the earlier version of the same Conference Series, we presented our initial efforts to develop a numerical model of the physical processes determining the timing resolution of Micro-Pattern Gaseous Detectors (MPGD). In the present version, we plan to report further progress in terms of improving the computational model and its applications to a much wider range of gaseous detectors, including recently proposed MPGDs such as the picosec and MRPCs.

In a series of detailed simulations for estimating time resolution of different gaseous detectors, we have made an attempt to include the effects of most of the important factors, including statistics and distribution of primary electrons, fluctuations related to transport, gain fluctuation, and finally, contribution of signal collection and processing. From the presented studies, we will try to draw general conclusions about the parameters determining the temporal resolution of gaseous detectors.

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