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Novel Gated Grid Utilization for Time Projection Chambers[1]
GENE VAN BUREN, Brookhaven National Laboratory, JAMES H. THOMAS, Lawrence Berkeley National Laboratory — Large TPCs, such as STAR or ALICE, have traditionally been built with wire chamber readout using a gated wire grid to trigger the event readout cycle. More modern TPCs, such as the ALICE upgrade and possibly sPHENIX, plan to use GEM chamber readout without a gated grid in order to be able to read events at even higher rates than a continually shuttered gated grid will allow. We are interested in scenarios where an existing TPC with a gated grid structure can be used to acquire events at higher rates by leaving the gated grid open for several events rather than to synchronize the opening and closing of the gate with each event. This mode is enabled by the large difference in drift velocities (approximately four orders of magnitude) between the incoming electrons and the outgoing ions. We will report on our progress in understanding the performance of such an operating mode.

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