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Design Challenges for a High-Rate TPC with Micromegas Readout

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Experiments such as PANDA at the Facility for Antiproton and Ion Research (under construction in Darmstadt, Germany) and the proposed TAPAS antiproton experiment at Fermilab require Time Projection Chambers with good spatial and dE/dx resolution and very high rate capability, to cope with the anticipated ˜10 MHz interaction rate and particle rates in the 20 to 50 MHz range. Issues to be dealt with include space-charge-induced distortion of the drift field and dead-timeless readout electronics that can cope with the high data rate. Promising solutions to these challenges will be presented.

Author: Prof. KAPLAN, Daniel (Illinois Institute of Technology)

Co-authors: Dr GIOMATARIS, Ioannis (CEA Saclay); Dr COLAS, Paul (CEA Saclay)

Presenter: Prof. KAPLAN, Daniel (Illinois Institute of Technology)

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