

Abstract Submitted  
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**Particle Identification Using Cost Effective mRPC Technology  
for Time-of-Flight Measurements with Less than 10 ps Time Resolution**

TAYLOR SHIMEK, Texas State University — This presentation will introduce the use of multi-gap Resistive Plate Chambers (mRPCs) for time of flight (TOF) based particle identification (PID) in nuclear and high-energy physics. The mRPC technology is developed for use in future experiments at the planned Electron Ion Collider, EIC. TOF PID using mRPCs with 10 ps timing resolution will make it possible to precisely determine the flavor content of valence- and sea-quarks in the proton through semi-inclusive deep inelastic scattering with identified pions and kaons. A first mRPC prototype using float glass resistive plates at UIUC has reached a timing resolution of 21 ps. In this presentation I discuss an effort to replace the float glass with cheaper Mylar-based resistive plates. I will also discuss the design and construction of a first prototype and present initial results on signal development, efficiencies and timing resolution of the mRPC prototype.

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