

Abstract Submitted  
for the DNP16 Meeting of  
The American Physical Society

**Comparing Novel Multi-Gap Resistive Plate Chamber Models<sup>1</sup>**

HALEY STIEN, Abilene Christian University, EIC PID CONSORTIUM COLLABORATION — Investigating nuclear structure has led to the fundamental theory of Quantum Chromodynamics. An Electron Ion Collider (EIC) is a proposed accelerator that would further these investigations. In order to prepare for the EIC, there is an active detector research and development effort. One specific goal is to achieve better particle identification via improved Time of Flight (TOF) detectors. A promising option is the Multi-Gap Resistive Plate Chamber (mRPC). These detectors are similar to the more traditional RPCs, but their active gas gaps have dividers to form several thinner gas gaps. These very thin and accurately defined gas gaps improve the timing resolution of the chamber, so the goal is to build an mRPC with the thinnest gaps to achieve the best possible timing resolution. Two different construction techniques have been employed to make two mRPCs. The first technique is to physically separate the gas gaps with sheets of glass that are .2mm thick. The second technique is to 3D print the layered gas gaps. A comparison of these mRPCs and their performances will be discussed and the latest data presented.

<sup>1</sup>This research was supported by US DOE MENP Grant DE-FG02-03ER41243

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Date submitted: 22 Jul 2016

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