

# A new Transition Radiation detector based on GEM technology

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Transition Radiation Detectors (TRD) has the attractive features of being able to separate particles by their gamma factor. The classical TRDs are based on Multi-Wire Proportional Chambers (MWPC) or straw tubes, filled with Xenon based gas mixture to efficiently absorb transition radiation photons. While it works for experiments with relatively low particle multiplicity, the performance of MWPC-TRD in experiments with luminosity of order  $10^{34} \text{ cm}^2 \text{ s}^{-1}$  and above, is significantly deteriorated due to the high particle multiplicity and hence the channel occupancy. Replacing MWPC or straw tubes with a high granularity Micro Pattern Gas Detectors (MPGD) like GEM, could improve the performance of TRD. In addition, GEM technology allows to combine a high precision tracker with TRD identifier. This report presents a new TRD development based on GEM technology for the future Electron Ion Collider (EIC). First beam test was performed at Jefferson Lab (Hall-D) using 3-6 GeV electrons. GEM-TRD module has been exposed to electrons with fiber radiator and without. The first results of test beam measurements and comparison with Geant4 Monte Carlo will be presented.

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