

Abstract Submitted  
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**Resolution Studies of a GEM-TPC in a High Magnetic Field**

GABE ROSENBAUM, DEAN KARLEN, PAUL POFFENBERGER, University of Victoria — The University of Victoria detector research team has been testing a prototype for an inner tracker for use at the proposed International Linear Collider. This detector must be capable of attaining excellent momentum resolution (which translates into needing excellent spatial resolution). The University of Victoria's prototype detector is a Time Projection chamber (TPC). A TPC uses a pad array to collect ionization tracks, as well as timing information to reconstruct tracks of charged particles in three dimensions. Our detector uses gas electron multipliers (GEMs) for electron gain in the gas. Tests over the last two years have been conducted to determine the detector's capabilities. For these tests the chamber was operated in a high magnetic field while reconstructing cosmic ray tracks. Tests were done at TRIUMF (Vancouver) using a 1 tesla solenoid and at DESY (Hamburg) using a 5 tesla superconducting magnet. A UV laser system was also designed and built to aid in calibration and in assessing systematics. The results of these tests will be presented demonstrating the excellent tracking resolution of a GEM-TPC.

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