

**Abstract Submitted for the 50th Annual Meeting  
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Category Number and Subject:

Theory     Experiment

**Penning Gauge Sensitivity and Spectra for Use in DIII-D,\***  
T.Y. Sheffield, *TCU*, W.P. West, N.H. Brooks, R.J. Boivin, *General Atomics*, B. Labombard, *MIT* – Cold cathode ionization gauges are useful in DIII-D for measuring the neutral density in the periphery region and preferable to those using a hot filament due to increased reliability. We will report on investigations of the performance of a Penning gauge under conditions expected in DIII-D. In particular, the sensitivity of the gauge in a magnetic field tilted at small angles from the axis, the performance and sensitivity with pressures ranging from 0.01 to 10 mTorr, and spatial plasma mode jumps as pressure and magnetic field strength vary will be discussed. Spectral line intensity emitted by the discharge within the gauge will be presented with the aim of reliably reporting the partial pressures of impurity gases. Electron density, temperature, and fluctuations within the gauge are examined using a Langmuir probe.

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