

**Abstract Submitted for the Forty-Ninth Annual Meeting
Division of Plasma Physics
November 12–16, 2007, Orlando, Florida**

Category Number and Subject: 5.6.2. DIII-D Tokamak

Theory Experiment

Results of Pilot Run of Next-Generation Thomson Scattering Diagnostic on DIII-D,* D.M. Ponce, B.D. Bray, T.M. Deterly, C.-L. Hsieh, and C. Liu, *GA* – A new prototype polychromator assembly and data acquisition system has been deployed during plasma operations at DIII-D for electron temperature and density measurement. The new polychromator features detectors that incorporate 500 MHz bandwidth amplifiers (OPA656) with low input bias current and an overall gain of 360 and an integration and a sample-and-hold circuit to provide analog output into a data acquisition digitizer. It also incorporates a TEC cooling circuit to maintain the avalanche photo-diodes (APDs) at 17°C with a stability of $\pm 0.1^\circ\text{C}$ in order to reduce the environmental noise and reduce temperature fluctuations. The data acquisition system is a D-TACQ DT100 system with a 96 channel 250 kSPS ACQ196CPCI board. The new system provides the flexibility to increase both spatial and time resolution by removing limitations imposed by the old CAMAC system. Calibration and discharge data, along with measured electron temperature and density, will be compared to the ones obtained with the existing system.

*Supported by the US DOE under DE-FC02-04ER54698.