

**Abstract Submitted for the 55th Annual Meeting  
Division of Plasma Physics  
November 11-15, 2013  
Denver, Colorado**

Category Number and Subject: 5.4.0 Divertors, edge physics &  
fueling

[ x ] Theory [ ] Experiment

**OEDGE Modeling of DIII-D Density Scan Discharges  
Leading to Detachment,\*** J.D. Elder, P.C. Stangeby, C. Tsui,  
*U. Toronto*; A.W. Leonard, B.D. Bray, N.H. Brooks, *GA*; J.A.  
Boedo, D.L. Rudakov, *UCSD*; J.G. Watkins, *SNL*; E.A. Unterberg,  
*ORNL*; C.J. Lasnier, A.G. McLean, *LLNL* – The OEDGE code is  
used to model the edge plasma for discharges from a density scan  
experiment on DIII-D. In this experiment the plasma density was  
increased over a series of L-mode discharges starting with a lower  
density discharge with both targets attached ( $n_e=1.6 \times 10^{19} \text{ m}^{-3}$ ) and  
ending with a higher density discharge with both targets detached  
( $n_e=4.5 \times 10^{19} \text{ m}^{-3}$ ). These discharges used large X-point sweeps to  
maximize plasma measurements. Scans with the recently installed  
swing probe at the inner wall provided  $n_e$  and  $T_e$  measurements of the  
inner divertor. Target Langmuir probe, Thomson scattering and  
spectroscopic measurements in the divertor were also made. These  
discharges are among the best diagnosed discharges ever made on  
DIII-D. For attached plasmas, OEDGE modeling replicates quite  
well the relation between divertor measurements and measurements  
in the main SOL, indicating that for attached divertor conditions the  
controlling physics appears to have been identified and correctly  
incorporated in OEDGE.

\*Work supported in part by the US DOE under DE-FC02-  
04ER54698, DE-FG02-04ER54578, DE-AC04-94AL85000, DE-  
AC05-00OR22725, and DE-AC52-07NA27344.