

Abstract Submitted  
for the DPP06 Meeting of  
The American Physical Society

**Steady-State, High-Performance Operation of DIII-D<sup>1</sup>** P.A. POLITZER, General Atomics, FOR THE DIII-D AT THRUST TEAM — The DIII-D AT program objective is to develop and demonstrate a steady-state scenario with performance that extrapolates to  $Q>5$  in ITER. This year, we examine two aspects of AT optimization. Using the newly improved pumping, we have established a double-null, high triangularity AT reference plasma. Further optimizing this shape by varying squareness ( $\zeta$ ) has shown that confinement appears to improve with reduced  $\zeta$  and that there is an optimum  $\zeta$  for MHD stability. Changes in pedestal and ELM conditions with varying  $\zeta$  are being analyzed. We are also undertaking experiments to optimize the  $q$  profile for AT operation. As the tools needed for maintaining a stationary high performance  $q$  profile are not yet available, we concentrate on optimization under slowly varying transient conditions, using varying combinations of co- and counter-injection as well as  $B_T$  ramping to modify the current profile. The variables are  $q_{min}$  ( $>2$ ),  $q_0 - q_{min}$  (range 0-1), and  $\rho_{q_{min}}$  ( $>0.5$ ). Issues being addressed are the nature of the limiting instabilities ( $n = 2$  and 3 are predicted to dominate), the dependences of the  $\beta$  limit and of  $f_{NI}$  on  $q_{min}$  and rotation.

<sup>1</sup>Supported by the US DOE under DE-FC02-04ER54698.

P.A. Politzer  
General Atomics

Date submitted: 21 Jul 2006

Electronic form version 1.4