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**Stationary Discharges in the DIII-D Tokamak**<sup>1</sup> T.C. LUCE, J.R. FERRON, A.W. HYATT, P.A. POLITZER, J.T. SCOVILLE, A.G. KELLMAN, R.J. LA HAYE, General Atomics, M.R. WADE, M. MURAKAMI, ORNL, C.J. LASNIER, LLNL, J.G. WATKINS, SNL — Discharges with stationary pressure and current profiles and the wall particle source in equilibrium have been demonstrated on the DIII-D tokamak. The pressure profile is constant for  $>30 \tau_E$  and the current profile for  $\sim 2$  relaxation times. The particle inventory is maintained by gas puffing, neutral beam fueling, and pumping with no net particle exchange with the wall. These discharges have  $q_{95} > 4$ . In order to maintain the fusion gain at levels comparable with conventional ELMing H-mode scenarios at  $q_{95} \sim 3$ , enhanced in  $\beta$  and  $\tau_E$  are needed. The achieved values of  $\beta_N H_{89} = 7$  for 6 s and  $\beta_N H_{89} = 8.5$  for  $\sim 4\tau_E$  indicate such enhancements are available. The key to the high performance appears to be reaching significant  $\beta$  values before  $q_{min}$  reaches 1. In this case, the current profile is stationary with  $q_{min} > 1$  with a small 3/2 tearing mode. After stationary current profiles are found,  $\beta$  has been raised to the no-wall  $n = 1$  limit without exciting further tearing modes. Comparison to scenarios in future tokamaks will be presented.

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- Prefer Oral Session  
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