

Abstract Submitted  
for the DPP08 Meeting of  
The American Physical Society

**Predictions of H-mode performance in ITER**<sup>1</sup> ROBERT BUDNY, PPPL — Time-dependent integrated predictions of performance metrics such as the fusion power  $P_{DT}$ ,  $Q_{DT} \equiv P_{DT}/P_{ext}$ , and alpha profiles are presented. The PTRANSF [1] code is used, along with GLF23 to predict plasma profiles, NUBEAM for NNBI and alpha heating, TORIC for ICRH, and TORAY for ECRH. Effects of sawteeth mixing, beam steering, beam shine-through, radiation loss, ash accumulation, and toroidal rotation are included. A total heating of  $P_{ext}=73\text{MW}$  is assumed to achieve H-mode during the density and current ramp-up phase. Various mixes of NNBI, ICRH, and ECRH heating schemes are compared. After steady state conditions are achieved,  $P_{ext}$  is stepped down to lower values to explore high  $Q_{DT}$ . Physics and computation uncertainties lead to ranges in predictions for  $P_{DT}$  and  $Q_{DT}$ . Physics uncertainties include the L→H and H→L threshold powers, pedestal height, impurity and ash transport, and recycling. There are considerably more uncertainties predicting the peak value for  $Q_{DT}$  than for  $P_{DT}$ .

[1] R.V. Budny, R. Andre, G. Bateman, F. Halpern, C.E. Kessel, A. Kritz, and D. McCune, Nuclear Fusion **48** (2008) 075005.

<sup>1</sup>Work supported by DoE contract DE-ACO2-76CHO3073.

Robert Budny  
PPPL

Date submitted: 20 Jul 2008

Electronic form version 1.4