Abstract Submitted
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H-mode threshold physics studies on Alcator C-Mod in support of ITER Y. MA, J.W. HUGHES, B. LABOMBARD, A.E. HUBBARD, E.S. MARMAR, MIT PSFC, D.C. MCDONALD, EFDA — Comprehensive studies on H-mode threshold physics have been conducted on Alcator C-Mod tokamak, covering many ITER-relevant conditions, *e.g.* similar magnetic field and density range, metallic wall, and divertor configuration. C-Mod experiments confirm that the density dependence of H-mode threshold power (P_{th}) is U-shaped without clear dependence on plasma current, and the local minimum of P_{th} in density (n_{min}) decreases as B_T is reduced [1]. An effect of divertor geometry on P_{th} was identified, with a dramatic ($\sim$50%) reduction in P_{th} seen in "slot" divertor operation accompanied by longer SOL connection length [2]. Experimental results were also compared with a new physics-based model for P_{th}[3], showing reasonable agreement of density, B_T, and divertor geometry dependences with model predictions. A significant implication of this model is that n_{min} occurs as the SOL transitions from sheath-limited to conduction-limited regime, which also seems to agree with experiments. Supported by USDoE award DE-FC02-99ER54512.

[1] Y.Ma, *et al* Nucl. Fusion **52** (2012) 023010.
[2] Y.Ma, *et al* PPCF **54** (2012) 082002.
[3] W.Fundamenski, *et al* Nucl. Fusion **52** (2012) 062003.

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