

Abstract Submitted
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Triggered confinement and pedestal temperature enhancement in NSTX H-mode discharges¹ R. MAINGI, J. CANIK, Oak Ridge National Laboratory, R. BELL, S. GERHARDT, S. KAYE, B. LEBLANC, PPPL, T. OSBORNE, General Atomics, NSTX TEAM — We report progress in the extension of a high performance regime (“Enhanced Pedestal” or EP H-mode) in NSTX discharges, where the pedestal temperature doubles and the energy confinement increases by 50%, above and beyond the confinement enhancement from lithium wall coatings [1]. The spontaneous transition is triggered by a large edge-localized mode, either natural or externally triggered by 3-D fields; the EP H-mode itself is ELM-free. The transport barrier grows inward from the edge, with a doubling of both the pedestal pressure width and the spatial extent of steep radial electric field shear. While short EP H-mode phases were previously reported [2], an EP H-mode with duration up to three energy confinement times was recently observed. The normalized beta ~ 6.5 is amongst the highest values sustained in NSTX. Moreover the non-inductive fraction ~ 0.65 is the highest plasma current ~ 0.9 MA in NSTX. Experiments are continuing for achievement of reproducible EP H-modes.

[1] H.W. Kugel, et. al., Phys. Plasma **15** (2008) 056118.

[2] R. Maingi, et. al., J. Nucl. Mater. **390-391** (2009) 440.

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