Abstract Submitted
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Effect of 3-D magnetic perturbations on pedestal structure and transport in NSTX[1] J.M. CANIK, J.-W. AHN, R. MAINGI, ORNL, R.E. BELL, A. DIALLO, S.P. GERHARDT, B.P. LEBLANC, J.E. MENARD, J.-K. PARK, M. PODESTA, PPPL, S.A. SABBAGH, Columbia U — The application of non-axisymmetric magnetic perturbations has varied effects on the pedestal structure in the National Spherical Torus Experiment. Although the resonant part of the perturbation is sufficient to ergodize the magnetic field provided screening is weak, the expected reduction in the electron temperature is not typically observed. Rather, in initial experiments to measure the effect of 3-D fields, the pedestal electron temperature was observed to increase by 30%. During later experiments that used thick lithium coatings on the plasma-facing components, this increase was not observed, but instead a flattening in the electron temperature and density profiles was measured slightly inside the pedestal. The impact of 3-D fields on pedestal structure under varying operating conditions will be presented. The edge transport rates inferred from these experiments will be compared to several theoretical predictions. These include stochastic transport in magnetic fields that include plasma response, as well as neoclassical transport due to the 3-D magnetic fields, calculated under the assumption of full screening of the resonant perturbations.

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