Abstract Submitted
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Study of boundary diffusion via density fluctuation measurement using the FIReTIP system on NSTX[1] K.C. LEE, C.W. DOMIER, M. JOHNSON, W.-C. TSAI, N.C. LUHMANN, JR., UC Davis, H. PARK, POSTECH, B.P. LEBLANC, R.E. BELL, R. KAITA, PPPL, S.A. SABBAGH, Columbia University — The Far Infra Red Tangential Interferometry/Polarimetry (FIReTIP) system on the National Spherical Torus Experiment (NSTX) measured boundary density fluctuations with upgraded time resolution up to 3.3 MHz in 2009. The density fluctuation level compared with the energy confinement from EFIT showed agreement with the turbulence induced diffusion coefficient which was recently introduced [1]. According to the gyrocenter shift theory, the plasma diffusion at the boundary is dependent on the density fluctuation level and the density fluctuation level is dependent on the Reynolds number of the poloidal ion gyrocenter drift arising from collisions with boundary neutrals. FIReTIP density fluctuation data are also compared with various plasma parameters which determine the Reynolds number such as the radial electric field and plasma temperature in the vicinity of separatrix for the study of the L\H transition mechanism. [1] K. C. Lee, Plasma Phys. Control. Fusion, Vol. 51, 065023 (2009)

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