

Abstract Submitted
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Connection between the Weakly Coherent Mode and particle transport across the LCFS in the I-mode¹ A. DOMINGUEZ, E.S. MARMAR, J.L. TERRY, B. LABOMBARD, M. GREENWALD, A.E. HUBBARD, J.W. HUGHES, PSFC-MIT, G.J. KRAMER, PPPL, A.E. WHITE, D.G. WHYTE, PSFC-MIT — The I-mode regime is characterized by the formation of ion and electron temperature pedestals, while maintaining L-mode-like radial density profiles [1]. Changes in edge density, temperature and magnetic field fluctuations accompany the L-mode to I-mode transition with reduction of fluctuations in the 50-150kHz range as well as the appearance of a Weakly Coherent Mode (WCM) in the 150-300kHz range. Previous work[2] has established a connection between the midrange fluctuation reduction and a decrease in the effective thermal diffusivity in the pedestal region. The mechanism for maintaining sufficient particle transport to avoid impurity accumulation has been unclear. In this work, quantitative comparisons are made between particle transport measurements across the LCFS and the intensity of the WCM in the I-mode. The particle transport has been estimated using $D\alpha$ profiles measured near the outboard midplane and the intensity of the WCM is obtained by spectral analysis of density fluctuations from reflectometry. The measurements show correlations between the particle transport and the WCM intensity, supporting evidence that the WCM causes enhanced transport.

[1] D.G. Whyte, et al., Nucl. Fusion 50 (2010)105005.

[2] A.E. Hubbard, et al., Phys. Plasmas 18(2011)056115

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