Abstract Submitted
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Particle Transport Analysis Using Modulated Gas Puff Technique in DIII-D[1] L. ZENG, E.J. DOYLE, T.L. RHODES, L. SCHMITZ, W.A. PEEBLES, UCLA, S. MORDIJCK, UCSD, J.S. DEGRASSIE, GA — By using gas puff modulation techniques, the electron particle diffusion coefficient D, and pinch velocity V, have been experimentally measured as a function of radius in a wide range of plasma operating regimes, including Ohmic, L-mode, H-mode, QH-mode, and RMP ELM-suppressed plasma regimes. The time and spatially resolved measurements from a profile reflectometer system show clear density profile perturbations associated with the gas puff modulations deep into the plasma core in L-mode and Ohmic plasmas. Along with the particle transport data, simultaneous detailed local turbulence measurements have been obtained for the first time. These fluctuation data clearly indicate that core plasma turbulence is significantly modified by external gas puffs, providing a new level of detail for which the plasma response can be modeled. The data also suggest a link to momentum transport. The extensive new set of transport and turbulence data will be compared to the theory-based models (TGLF and GYRO).

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