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Theory Experiment

Effect of Resonant Magnetic Perturbations (RMPs) on Local Density Decay During Pellet Injection in DIII-D,* L. Zeng, T.L. Rhodes, W.A. Peebles, G. Wang, L. Schmitz, E.J. Doyle, *UCLA*, L.R. Baylor, T.C. Jernigan, *ORNL*, T.E. Evans, *General Atomics* – By using a high temporal (25 microseconds) and spatial (~0.5 cm) resolution profile reflectometer system, the local density evolution due to Deuterium pellet injection has been investigated in DIII-D. It is observed that either no ELMs are triggered, or small ELMs are triggered by fueling pellets during ELM suppressed RMP operation. However, ~150 ms after the pellet injection the plasma returns to ELM-free status. The density evolution shows local density decay time is a decreasing function of radius, with the fastest decay at around normalized $\psi \sim 0.92$ which is within the magnetic island overlap regime. By contrast, pellet induced local density decay time is almost independent of radius for non-RMP ELMing plasmas, with the decay time 2 times longer than with RMPs. The results suggest RMPs enhance particle transport in plasmas. The dependence of local decay time on the magnitude of RMPs, associated density fluctuations, and E_r behavior are further investigated.

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