

Abstract Submitted
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Studies of Filament Formation during Lithium Pellet Injection in Alcator C-Mod¹ B. BOSE, E. MARMAR, PSFC, D.R. MIKKELSEN, PPPL —

Using a high speed CCD camera, (frame rate up to 500 kHz) and a stereoscopic imaging system, the detailed three dimensional evolution of filaments formed in the ablation clouds of injected lithium pellets has been studied on the Alcator C-Mod tokamak. After formation, the filaments move primarily in the poloidal direction during the first $10\mu s$ after their formation. During the '07 and '08 campaigns the stereo-imaging system was employed to make a survey of the characteristics of filament trajectories in a variety of background plasmas and was then used to determine the filaments' statistical properties. The distributions of poloidal velocities of the filaments show no statistical variation with local density, temperature or magnetic shear, but do show significant variation with the local safety factor and plasma collisionality. The filament velocity distributions and the spatial scales of the filament trajectories are compared with simulated turbulent ExB flows from the nonlinear gyrokinetic solver GYRO. Simulations using plasma profiles just prior to the injection do not generate large enough fluctuations in ExB drift to be consistent with experimental data from the imaging diagnostic. Additional simulations using estimates of the strongly perturbed temperature and density profiles will also be discussed.

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