Pellet Imaging Diagnostic

Brock Bose, Earl Marmar, Paul Parks
MIT PSFC, Cambridge MA, * General Atomics, San Diego, CA
Work Supported by O.A.E. Coop. Agreement DE-FG02-98ER54512

Abstract

Ultra high speed imaging (frame rate ~ 500 kHz) of injected Li pellets into Alcator C-Mod during the 2005 campaign was evaluated by a stereoscopic imaging diagnostic system. The system consists of two 24mm camera lenses, with a field of view of 9.4 degrees, giving rise to a near uniform rotation of the ablation column due to the magnetic field. The column reaches a characteristic frequency less than 100 kHz. Ablation striations with velocities ranging from 1 cm/s to 1 m/s were observed in high magnetic field (7.5 T) tokamaks. The evolution seen on the H mode plasmas indicates that the striation velocity ranges from 1 cm/s to 1 m/s. The striations move only in the direction of the striations as a function of radial position. The radial electric fields that ranged up to 40 kV/m, with a similar spatial scale of 10 cm to 100 cm, are consistent with observations. The striation velocity tend to change direction on a length scale of the order of tens of gyro-radii.

Parks Theory

A bifurcated fiber bundle and charge coupled device camera system on B-Port of Alcator C-Mod for the 2005 campaign. The system consists of two 24mm camera lenses, with a field of view of 9.4 degrees.

Experimental Objectives

References