

Abstract Submitted  
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**First Experimental Evidence of the Geodesic Acoustic Mode (GAM) Impurity Frequency Scaling in Alcator C-Mod I-mode<sup>1</sup>** WILLIAM MCCARTHY, AMANDA HUBBARD, BRIAN LABOMBARD, ADAM KUANG, JAMES TERRY, JERRY HUGHES, Massachusetts Institute of Technology MIT — The I-mode confinement regime is characterized by an H-mode like pressure pedestal and an L-mode like density edge profile, preventing impurity accumulation. A common feature of I-mode on Alcator C-Mod is a Low Frequency Edge Oscillation (LFEO) 8-30 kHz, concurrent with the ubiquitous Weakly Coherent Mode (100-300 kHz); the LFEO has been tentatively identified as the Geodesic Acoustic Mode by Gas Puff Imaging and a database analysis of central LFEO frequencies. High time resolution Electron Cyclotron Emission measurements have revealed two important spectral properties of the LFEO: a modulation of the frequency by the sawtooth cycle in which the frequency drops as the pedestal temperature rises, and an inverse dependence of the frequency on the impurity concentration of the plasma. The second observation is shown to be qualitatively consistent with two gyrokinetic GAM frequency scalings in the presence of impurity ions developed by Guo et al. and Sasaki et al. respectively, while the mechanism behind the first observation remains an open question. Supported by US DoE award SC0014264.

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