

Abstract Submitted
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Structure Measurement of Global Alfvén Eigenmodes via Fast Sweep Frequency-modulated Profile Reflectometry in DIII-D¹ L. ZENG, N. A. CROKER, W. A. PEEBLES, T. L. RHODES, University of California, Los Angeles — Measurement of fast-ion driven global Alfvén eigenmodes (GAE, $\omega < \omega_{ci}$) is achieved via fast sweep, frequency modulated density profile reflectometry in beam-heated L-mode DIII-D plasmas. These modes are of interest because they may cause electron energy transport. The radial distribution of the reflectometer phase (or time delay) perturbations induced by GAE modes with frequency 5 MHz is measured over the range $0.2 < \rho < 0.6$ with the peak occurring at $\rho \approx 0.4$. The phase perturbations are proportional to the mode generated cutoff location displacements allowing the local n_e fluctuation profile generated by the GAE to be determined. Comparison of the determined mode structure will be made with independent fixed frequency reflectometer measurements as well as theoretical expectations. This new measurement can broaden the capability of profile reflectometry and advance development of AE spectroscopy as a tool for non-invasive diagnosis of fast-ions in DIII-D and burning plasmas such as ITER.

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