

Abstract Submitted  
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**The emission spectrum of fast neutrals in Alcator C Mod and its use as a fast ion diagnostic**<sup>1</sup> K.T. LIAO, W.L. ROWAN, I.O. BESPAMYATNOV, Fusion Research Center, The University of Texas at Austin, A. BADER, R.S. GRANETZ, MIT-PSFC — The emission spectrum of fast neutrals will be used to investigate the spatial distribution and temporal dynamics of fast ions in Alcator C-Mod. Fast hydrogen ions are formed by wave particle interaction between externally applied radio frequency (RF) fields and the plasma. These charge exchange with the neutrals in a diagnostic beam to form a population of fast neutrals. The newly formed fast neutrals emit a Doppler-shifted  $H_\alpha$  spectrum which stands out against the wing of the broad ambient background spectrum of plasma  $D_\alpha$ . Competing spectral features are emission from the cold D and H at the edge, the Doppler-shifted, beam emission spectrum, and various continuum emission processes. The unique contribution of this diagnostic is that it measures fast ions inside the plasma. The information derived from this and other fast ion diagnostics will be used to validate the physical models for RF deposition via minority ions.

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