

Abstract Submitted
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Multi-Frequency ICRFDiagnostic of Tokamak Plasmas D.J. LA-FONTEESE, R.J. TAYLOR, G.J. MORALES, University of California, Los Angeles — Fast Alfvén waves at twice the local ion-cyclotron frequency within the radial profile of a tokamak plasma carry information about the global properties of the plasma and are also sensitive to the value of the plasma parameters (e.g. density, ion temperature) at the location of the second-harmonic resonant layer. These properties suggest a new diagnostic capability that relies on the simultaneous launching of several fast waves with frequencies spanning the second harmonic resonance across the plasma radius. The cross correlations of the phase, amplitude, antenna loading, and resonant-Q value of toroidal eigenmodes should, in principle, allow the simultaneous sampling of plasma-profile features. The present system, as implemented in the UCLA Tokamak, launches 6 frequencies and samples the corresponding time series of the propagating magnetic field with small B-dot loops at three toroidal positions. Loading resistances four times larger than vacuum loading are observed at highest densities. Unusually long quiet-periods (300 ms) are revealed by the phase of some frequencies while others remain noisy. Research supported by U.S. DoE grant DE-FG03-86ER53225

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