

INVESTIGATION OF NARROWBAND ECE BURSTS IN DIII-D PLASMAS*

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In the DIII-D tokamak, intense, narrowband bursts of millimeter wave power have been observed at second harmonic electron cyclotron emission (ECE) frequencies in certain plasma conditions. These bursts have an intensity 100-1000 times the blackbody ECE level and have bandwidths of 200 to 4000 MHz. They primarily occur in conjunction with three characteristic plasma conditions, all at low density: ELMs in H-mode, edge harmonic oscillation (EHO) in quiescent H-mode, and disruptions, and all are associated with some type of MHD activity. The bursts associated with the EHO are of particular interest: the bursts have a specific phase relationship with the steady-state edge oscillation and there is a threshold amplitude of the MHD below which the bursts are not observed. Also, the EHO bursts occur at frequencies upshifted from the ECE resonance frequency that matches the physical location of the EHO in contrast to the ELM and disruption bursts which occur at downshifted frequencies. We consider these observations in relation to models of collective instabilities of high energy electrons and magnetic structures in the tokamak.

*Work supported by the U.S. Department of Energy under DE-FG03-97ER54415, DE-FG03-89ER51116, DE-FG03-99ER54541, DE-FG02-93ER54197.