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High power fast wave experiments in LAPD: interaction with density fluctuations and status/plans for ICRH[1] TROY CARTER, MICHAEL MARTIN, BART VAN COMPERNOLLE, WALTER GEKELMAN, PAT PRIBYL, STEPHEN VINCENA, SHREEKRISHNA TRIPATHI, UCLA, DIRK VAN EESTER, Laboratory for Plasma Physics, ERM-KMS, Belgium, KRISTEL CROMBE, Department of Applied Physics, Ghent University, Belgium — The LArge Plasma Device (LAPD) at UCLA is a 17 m long, up to 60 cm diameter magnetized plasma column with typical plasma parameters $n_e \sim 10^{12} - 10^{13}\text{cm}^{-3}$, $T_e \sim 1-10\text{eV}$, and $B \sim 1\text{kG}$. A new high-power (~ 200 kW) RF system and antenna has been developed for LAPD, enabling the generation of large amplitude fast waves in LAPD. Interaction between the fast waves and density fluctuations is observed, resulting in modulation of the coupled RF power. Two classes of RF-induced density fluctuations are observed. First, a coherent (10 kHz) oscillation is observed spatially near the antenna in response to the initial RF turn-on transient. Second, broadband density fluctuations are enhanced when the RF power is above a threshold a threshold. Strong modulation of the fast wave magnetic fluctuations is observed along with broadening of the primary RF spectral line. Ultimately, high power fast waves will be used for ion heating in LAPD through minority species fundamental heating or second harmonic minority or majority heating. Initial experimental results from heating experiments will be presented along with a discussion of future plans.

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Troy Carter
Univ of California - Los Angeles

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