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Experiments on Helicon Excitation and Off-Axis Current Drive on DIII-D: Status and Plans[1] R.I. PINSKER, R. PRATER, C.P. MOELLER, J.S. DEGRASSIE, J.F. TOOKER, J.P. ANDERSON, H. TORREBLANCA, M. HANSINK, GA, A. NAGY, PPPL, M. PORKOLAB, MIT — Fast waves in the LHRF, also called "whistlers" or "helicons," will be studied in experiments on the DIII-D tokamak beginning in autumn 2015. In the first stage, a 12-element traveling wave antenna ("comb-line") is installed in the DIII-D vessel for operation at very low power ($\sim$ 0.1 kW) at 476 MHz, with a well-defined launched $n_{||}$ spectrum peaked at 3.0. The goals of the low-power experiment include: (1) determining the efficiency with which the desired fast waves can be excited under a variety of plasma conditions in discharges relevant to the subsequent high-power current drive experiments and (2) proving that the radial and poloidal location at which the antenna will be mounted does not cause deleterious effects in the DIII-D discharges with high neutral beam power, and that the antenna is not damaged by fast ion losses, etc. Plans for 1 MW-level experiments with a single klystron beginning in FY17 are discussed. In addition to demonstrating off-axis current drive at an efficiency of $\sim$ 60 kA/MW in high-performance plasmas, these experiments will explore non-linear aspects of wave excitation, propagation and absorption such as ponderomotive effects and parametric decay instabilities.

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