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Observations of 0.3 kHz to 500 MHz Periodic Oscillations in the PFRC-2 Device¹ EMILY HO, Princeton Univ, CHARLES SWANSON, SAM COHEN, Princeton Plasma Physics Lab, PFRC TEAM — With a capacitively coupled 27-MHz RF system supplying up to 400 W of power in one end cell, hydrogen plasma was generated in the PFRC-2 device, operating in a tandem mirror mode. Langmuir probes were used to measure oscillations in the floating potential in the other PFRC-2 end cell, with a conducting floating boundary slightly downstream of the probe. A fast camera was used to examine visible plasma oscillations in PFRC-2 central cell. At speeds between 5 and 13 kfps, the fast camera showed oscillations below 700 Hz; corresponding peaks were found in the floating potential spectrum. Radial probe measurements suggest it to be a bursting $m=0$ mode. The probe data also showed large periodic MHz-range oscillations, at 27 MHz and its first 10 harmonics. A broad peak is near 300 MHz, close to the central-cell electron cyclotron frequency. The frequency of FFT peaks near 1 MHz, in the ICRF of the mirror-coil field, varied linearly with the magnetic field strength. These intermodulate with the RF signal, creating sidebands to the 27 MHz peak and its harmonics. We present findings from the fast camera of the rotating magnetic field mode.

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