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Visible-wavelength emission by Hydrogen in the Princeton FRC D.P. LUNDBERG, S.A. COHEN, PPPL — The Princeton Field-Reversed-Configuration (FRC) experiment is investigating prolate FRCs heated by odd-parity rotating magnetic fields. Using visible wavelength spectroscopy with both an iCCD-based 0.5m visible light spectrometer and a 0.5m monochromator, we have investigated the role of collisions with neutrals on plasma performance. Both atomic and molecular emission were recorded, with a time resolution of 0.05 ms. Analysis of the Fulcher alpha H_2 molecular band yields excited population rotational temperatures of 0.025-0.05eV, implying ground state rotational temperatures of 0.05-0.1eV. The molecular gas is largely dissociated in the first millisecond of the pulse.

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