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Measurements of electron density and energy content in the VX-30 helicon discharge ELLA SCIAMMA, ROGER BENGTON, University of Texas at Austin, GREG CHAVERS, CHRIS DOBSON, JONATHAN JONES, Propulsion Research Center, MSFC, FRANKLIN CHANG-DIAZ, VERLIN JACOBSON, JARED SQUIRE, Ad Astra Technologies — We have observed plasma conditions at several locations in the VASIMR experiment, VX-30, a 20 kW helicon plasma expanding into a nozzle. A three frequency interferometer (70, 90, 110 GHz) provided electron densities at these locations. We made absolutely calibrated spectroscopic measurements of He I and He II lines in the UV, visible, and near IR. A comparison with a collisional radiative model suggested that the actual electron density distribution function was not a Maxwellian, but rather was significantly underpopulated at higher electron energies. We will present preliminary results comparing our measurements with a spectral model using a non Maxwellian distribution.

Roger Bengtson
University of Texas at Austin

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