

Abstract Submitted
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Measurements of Nonlocal Electron Energy Distribution Functions in the Afterglow of an RF ICP Discharge¹ JON BLESSINGTON, West Virginia University, CHARLES DEJOSEPH, JR., Air Force Research Laboratory, VLADIMIR DEMIDOV, MARK KOEPKE, JASON WYNNE, West Virginia University — In previous work [1], it was shown that even a small number of nonlocal fast electron, which do not significantly affect the overall mean electron energy, can dramatically change the plasma and near-wall sheath properties. In this work, Langmuir probe measurements of electron density, temperature and energy distribution functions (EEDF) in the afterglow of low-pressure (30-50 mTorr) noble-gas rf ICP discharges have been carried out. The experimental setup is described in [2]. The primary focus of this work was the investigation of the high energy portion of the EEDF which shows peaks corresponding to electrons with energies 5-20 eV, depending on the gas mixture. These peaks arise from electrons produced in Penning ionization with metastable noble gas atoms. This fast component of the EEDF can be controlled independently on the slow electrons, a direct consequence of the nonlocality.

[1] V. Demidov et al. *PRL* **95**, 215002 (2005).

[2] W. Guo et al., *PSST* **10**, 43 (2002).

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