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**Volumetric Control of Anisotropic Electron Distribution Functions in Plasmas with Langmuir Oscillations** A.S. MUSTAFAEV, St. Petersburg State Mining University, I.D. KAGANOVICH, PPPL, V.I. DEMIDOV, WVU, S.F. ADAMS, AFRL — Given that the development of future microelectronics depends on the application and control of anisotropic electron distribution functions (AEDFs) in plasmas, the development of methods to measure and control AEDFs is of great importance. This talk presents the technique of AEDF measurements with flat one-sided electric probes in low pressure plasmas and demonstrates how volumetric excitation of Langmuir oscillations can modify and control AEDFs. It will be demonstrated that Langmuir oscillations can provide independent tailoring of the AEDF energetic part with respect to the angular velocity distribution and electron energy relaxation. Specific criteria for excitation of Langmuir oscillations will be provided and have been experimentally tested. The cross section for quasi-elastic collisions of the beam electrons with Langmuir plasmons has been estimated. The beam instability changes the shape of the AEDF with respect to its energies and hence changes the properties of the plasma. This circumstance should be taken into account in technologies that use plasmas with fast electrons. This work was supported by the DOE (DE-SC0001939), NSF CBET-0903635, AFOSR and the Ministry of Education of the Russian Federation.

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