

Abstract Submitted
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Electronic-Polarization Diagnostics of Anisotropic Electron Velocity Distribution Function¹ A.S. MUSTAFAEV, V.S. LITVINENKO, St.Petersburg State Mining Institute (Technical University), S.F. ADAMS, Air Force Research Laboratory, V.I. DEMIDOV, West Virginia University, J.M. WILLIAMSON, UES, Inc. — The electron velocity distribution function (EVDF) in anisotropic plasma has been investigated by both probe and magnetic-polarization Hanle techniques. In a helium beam-plasma discharge, the EVDF momentums have been measured. The depolarization of the $4^1D_2 - 2^1P_1$ helium atom spectral line was analyzed for a charged particle density of roughly 10^{11} cm^{-3} and the rate constant was determined for the misalignment of helium atoms in the 4^1D_2 state due to collisions with charged particles. A method for the remote investigation of anisotropic properties of plasma particles not readily amenable to contact diagnostics was tested experimentally. An advantage of the proposed method is the possibility of directly measuring the EVDF anisotropy in distant astrophysical and geophysical plasma objects. The experimental results and remote investigative technique will be presented.

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