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**Diagnostics of nonlocal plasmas: advanced techniques** ALEXANDER MUSTAFAEV, ARTIOM GRABOVSKIY, ANASTASIYA STRAKHOVA, National University of Mineral Resources "Mining," Department of General and Technical Physics, VLADIMIR SOUKHOMLINOV, Saint-Petersburg State University, Department of Physics — This talk generalizes our recent results, obtained in different directions of plasma diagnostics. First-method of flat single-sided probe, based on expansion of the electron velocity distribution function (EVDF) in series of Legendre polynomials. It will be demonstrated, that flat probe, oriented under different angles with respect to the discharge axis, allow to determine full EVDF in nonlocal plasmas. It is also shown, that cylindrical probe is unable to determine full EVDF. We propose the solution of this problem by combined using the kinetic Boltzmann equation and experimental probe data. Second-magnetic diagnostics. This method is implemented in knudsen diode with surface ionization of atoms (KDSI) and based on measurements of the magnetic characteristics of the KDSI in presence of transverse magnetic field. Using magnetic diagnostics we can investigate the wide range of plasma processes: from scattering cross-sections of electrons to plasma-surface interactions. Third-noncontact diagnostics method for direct measurements of EVDF in remote plasma objects by combination of the flat single-sided probe technique and magnetic polarization Hanley method.

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