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Cylindrical probe in nonequilibrium plasma - new possibilities ALEXANDER MUSTAFAEV, ARTIOM GRABOVSKIY, ANASTASIYA STRAKHOVA, National University of Mineral Resources — This talk presents the method of reconstruction full EVDF in plasmas with arbitrary degree of anisotropy. It will be demonstrated that cylindrical probe allows to determine only even components of the EVDF Legendre expansion. The odd components can be found by solving the kinetic Boltzmann equation, which relate the even- and odd- index coefficients (f_0, f_1) ; (f_0, f_1, f_2) etc., jointly with experimentally obtained even components.

$$\frac{\partial f_1}{\partial t} + v \left(\frac{\partial f_0}{\partial z} + \frac{2}{5} \frac{\partial f_2}{\partial z} \right) - \frac{eE_z}{m} \left[\frac{\partial f_0}{\partial v} + \frac{2}{5v^3} \frac{\partial}{\partial v} (v^3 f_2) \right] + \nu_{ea}^t f_1 = 0$$

The method has been experimentally tested in two dramatically different types of helium discharge: in positive column of glow discharge and in nonlocal plasma of beam discharge. The new possibilities of the proposed method have been illustrated. The reliability of the proposed method has been tested by comparing the experimentally obtained and theoretically calculated data and independent measurements, carried out using the flat single-sided probe. This work was supported by the Ministry of Education of the Russian Federation.

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