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Study of dust particle charge screening within the nonlocal charging theory NATALIA DEMKINA, IVAN DERBENEV, ANATOLY FILIPPOV, Troitsk Institute for Innovation and Fusion Research — In papers [1,2] it was shown that in a non-equilibrium plasma with one type of positive ions the dust particle potential was described by two exponentials, and for the case of three types of ions the potential was described by the superposition of three exponentials with three different screening constants [3]. In the present paper the EEDF non-locality influence on a dust particle potential distribution is considered in a two-component plasma of noble gases and nitrogen on the basis of a nonlocal charging model which consists of the electron and ion balance equations, the Poisson equation and the electron energy balance equation, obtained from the non-local momentum method [4]. It was found that the potential distribution in the vicinity of a dust particle is described by the sum of three exponentials. The screening constants and the pre-exponential coefficients are defined by the plasma parameters and the electron and ion sinks.

[1] A.V. Filippov et al., JETP Letters 81 (2005) 146.
[2] A.V. Filippov et al., JETP 104 (2007) 147.
[3] I.N. Derbenev and A.V. Filippov, Plasma Phys. Rep. 36 (2010) 105.
[4] A.V. Filippov et al, Plasma Phys. Rep. 29 (2003) 190.

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