Dusty plasmas in the DC glow dischsrge

Filippov A. V.[1,@], **Khomyakov N. A.**[2] **and Vovk P. A.**[2]

[1] State Research Center of the Russian Federation—Troitsk Institute for Innovation and Fusion Research, Pushkovykh Street 12, Troitsk, Moscow, 108840, Russia

[2] Moscow Institute of Physics and Technology, Institutskiy Pereulok 9, Dolgoprudny, Moscow Region, 141701, Russia

[@] fav@triniti.ru

This paper presents the results of analytical and numerical simulation of the positive column of a DC glow discharge in a cylindrical tube, as well as calculations of the charge on dust particles, accounting for the non-locality of the electron energy distribution function. The balance of forces—comprising ion drag, gravity, and electrostatic force—is also examined. In calculating the particle charge and the ion drag force, the highly anisotropic nature of the ion velocity distribution function is taken into account. The modeling is performed for the experimental conditions described in [1].

[1] Fedoseev A V, Filippov A V, Vasiliev M M and Petrov O F 2025 *Nanomaterials* **15**(23) 1802