

Non-linear screening scaling in a highly asymmetric complex plasma

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We investigate the features of non-linear screening of highly charged macroions by microions in a classical asymmetrically charged complex plasma. Two-component electroneutral systems of finite-sized macroions and oppositely charged point microions in an electroneutral spherically symmetric Wigner–Seitz cell with a central macroion and surrounding microions are studied. This work is devoted to the problem of the relationship between the effective (“visible”) charge of the macroion Z^* and its initial charge Z taking into account the effect of nonlinear screening. It is analyzed how this ratio changes with an increase in the charge of the central macroion. The characteristics of two modes are calculated in this dependence of the effective charge on the initial one [1, 2]. The self-similarity of the indicated dependence $Z^*(Z)$ has been demonstrated for various temperatures of the system, macroions concentrations and sizes of macroions [3].

[1] Martynova I A and Iosilevskiy I L 2019 *J. Phys.: Conf. Ser.* **946** 012147

[2] Martynova I A and Iosilevskiy I L 2019 *Contrib. Plasma Phys.* **58** 203–8

[3] Martynova I A and Iosilevskiy I L 2021 *Contrib. Plasma Phys.* **61** e202000142