COMPLEX PLASMAS PRESSURE IN THE AVERAGE WIGNER–SEITZ CELL MODEL WITH REGARD TO NONLINEAR SCREENING EFFECT

Martynova I.A.,[*][1] *Iosilevskiy I.L.*[1]

[1] *JIHT RAS, Moscow, Russia,* [2] *JIHT RAS, Moscow, Russia*
[*]martina1204@yandex.ru

We consider an equilibrium electroneutral complex plasma of finite-sized macroions with charges Z, $Z \gg 1$, and point oppositely charged microions with unit charges. We obtain system pressure in the Wigner–Seitz average cell model within the framework of the Poisson–Boltzmann approximation. It is demonstrated that the obtained pressure and isothermal compressibility are positive over the entire range of macroion concentrations [1] in comparison with [2, 3] where the macroions nonlinear screening effect in not taken into account.

1. Martynova I. A., Iosilevskiy I. L. // Contrib/ Plasma Phys. 2023. P. e202300097.
2. Khrapak S. A., Khrapak A. G., Ivlev A. V. and Morfill G. E. // Phys. Rev. E. 2014. V. 89, P. 023102.
3. Farouki R. T., Hamaguchi S. // J. Chem. Phys. 1994. V. 101, P. 9885.