non-linear screening scaling in asymmetric complex plasmas [[1]](#footnote-1)\*)

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In this paper, two-component electroneutral systems of finite-size macroions and oppositely charged point microions in an electroneutral spherically symmetrical Wigner-Seitz cell with a central macroion are studied. The features of non-linear screening of highly charged macroions by microions in classical asymmetrically charged complex plasma are investigated. 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 non-linear screening effect. 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].

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References

1. Martynova I.A., Iosilevskiy I.L., J. Phys.: Conf. Ser., 2019, Vol. 946, P. 012147.
2. Martynova I.A., Iosilevskiy I.L., Contrib. Plasma Phys., 2019, Vol. 58, P. 203.
3. Martynova I.A., Iosilevskiy I.L., Contrib. Plasma Phys., 2020, e202000142.

1. \*) [abstracts of this report in Russian](../ru/EC-Martynova.docx) [↑](#footnote-ref-1)