

## PLASMA POLARIZATION IN MASSIVE ASTROPHYSICAL OBJECTS

**I. Iosilevskiy**

*Moscow Institute of Physics and Technology (State University)*  
*Joint Institute for High Temperature (Russian Academy of Science)*  
*Extreme Matter Institute - EMMI (Germany)*

*E-mail: ilios@orc.ru*

Macroscopic plasma polarization, which is created by gravitation and other mass-acting (inertial) forces in massive astrophysical objects (MAO) is under discussion. Non-ideality effects due to strong Coulomb interaction of charged particles are introduced into consideration as a new source of such polarization. Simplified situation of totally equilibrium isothermal star without magnetic field and relativistic effects is considered. The study based on variational formulation of equilibrium statistical mechanics. It leads to conditions of constancy for generalized (electro)chemical potentials and/or conditions of equilibrium for all forces acting on each charged specie. New "non-ideality force" appears in such consideration. Hypothetical consequences of gravitational, inertial and non-ideality polarization on thermo- and hydrodynamics of MAO are under discussion.

### References

Iosilevskiy I.: 2009, *Contrib. Plasma Phys.*, **49**, 755, astro-ph:0902.2386v1