

# Collisionless self-gravitating statistical systems of scalarly interacting particles

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## Abstract

© 2016, Pleiades Publishing, Ltd. We consider the theory of collisionless statistical systems with interparticle scalar interaction. A mathematical model of such systems is constructed, and an exact solution of the Vlasov equation for the isotropic homogenous model of the Universe is found. Asymptotic solutions of the self-consistent Vlasov-Einstein model for conformally invariant scalar interactions are found. We obtain and study an exact cosmological solution of a self-consistent set of equations consisting of a collisionless kinetic equation for a plasma with interparticle scalar interaction and the scalar field equation with a source. It is shown that in the ultrarelativistic limit the scalar interaction of particles leads to generation of an effective mass of scalar bosons.

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