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Non-equilibrium distribution functions for the beginning rotation of cosmological body

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A model for interpretation of gravitational effect of particles into the forming gravitating and rotating body based on the statistical theory has been proposed in [1]-[4]. In this model bodies are shown to have fuzzy contours and are represented by spheroidal forms, i.e. as spheroidal bodies. In works [1]-[4], as a rule, it was supposed that a weakly gravitating body is isolated from influence of other fields and bodies; it is homogeneous in its chemical structure and has a low temperature; the process of gravitational interaction of particles is a slow-flowing one in time both immovable and rotating gravitating body.

This paper considers derivation of non-equilibrium function of particle distribution in space based on statistical model of rotating and gravitating cosmological body. All directions in space are considered to be equally valid, i.e. an isotropic space is dealt with. A dust-like body consisting of N similar particles of mass m0 is placed in it. Inside it, we choose some space coordinates and a direction in space. The cosmological body is considered as an spheroidal body consisting of N particles with mass m0 and beginning to rotate non-uniformly with an angular velocity f(omega).We choose a plane of rotation as (x, y) and z as an axis of rotation of spheroidal body. To obtain a distribution function for particles in space we use a cylindrical frame of reference (h, e, z). The choice of cylindrical rotating frame of reference gives us the advantage because the rotating spheroidal body remains relatively immovable in this system.

As for immovable frame of reference (x, y, z) , we introduce a distribution for all three coordinates h, e and z in the rotating frame of reference F(h, e, z) to locate a particle in the rotating frame of reference in a moment of time. We suppose that particles into the rotating spheroidal body do not move relatively rotating frame of reference, therefore, such particle has all three coordinates independently each other. Then according to the theorem of complex event probability we can obtain F(h, e, z) using the analogous scheme [1] for the case of immovable frame of reference (x, y, z).

The particles inside the gravitating spheroidal body (from the beginning of rotation with an angular velocity f(omega) begin to move in the opposite direction to the rotation owing to an inertia force action. In this connection, if the core of spheroidal body turns on a small angle e then the external particles rotate on -e . To find a non-equilibrium function of particle distribution for an rotating core of spheroidal body, we use the principle of detailed balance [5] under supposition that the functions of particle distribution for an immovable gravitating core as well as for an immovable gravitating cover before their interactions between each other are known from [2], [3], and a non-equilibrium function of particle distribution for the rotating and gravitating cover after its interaction with the core is found above.

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