

STRUCTURE OF GALAXIES EMBEDDED IN CLOUDS OF DARK MATTER

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ABSTRACT. The purpose of this poster is to draw attention to the recent papers of Cowsik and Ghosh (J.A.A. 7, 7, 1986 et seq. and Ap.J., 317, 26, 1987) where particles of dark matter, stars and galaxies are treated as collisionless gasses. The encounterless Boltzmann equations become coupled through the common gravitational potential in which they move. Assuming that the distributions have the Maxwellian or generalised Schwarzschild form, the potentials ϕ_g , ϕ_v due to the baryonic and dark matter are shown to satisfy the coupled equations:

$$\nabla^2 \phi_g = 4\pi G \rho_g(0) \exp\left[-\frac{m_g}{kT_g}(\phi_g + \phi_v)\right], \quad \nabla^2 \phi_v = 4\pi G \rho_v(0) \exp\left[-\frac{m_v}{kT_v}(\phi_g + \phi_v)\right].$$

These equations are solved by standard techniques and the solutions give satisfactory representations of the distribution of galaxies in clusters, the luminosity profiles of dwarf spheroidals, elliptical and spiral galaxies, as also the flat rotation curves of the spirals measured in the optical and at 21 cm.