FORMATION OF ANISOTROPY IN GALAXIES

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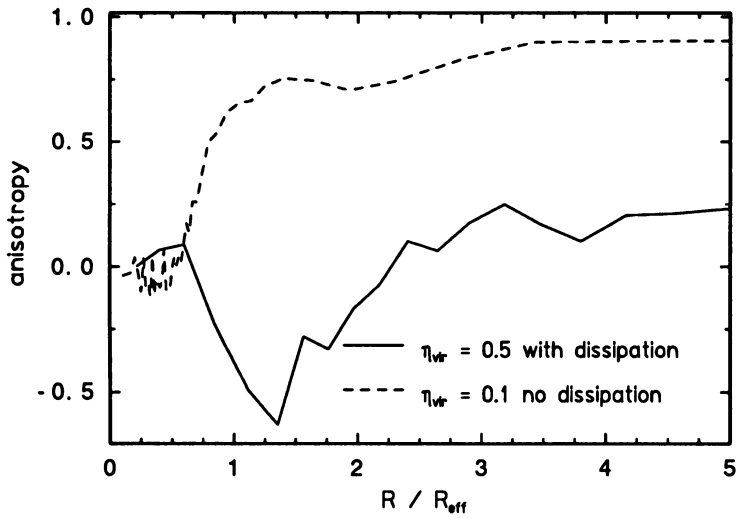

Since observations of elliptical galaxies show only a small fraction of gaseous matter, *dissipationless* N-body models are mainly used to follow the dynamical evolution of these systems. In order to end up with the observed de Vaucouleurs profile these models must be initially very cold which leads finally to a velocity distribution that is isotropic in the core and has a *positive* anisotropy $A \equiv 1 - (\sigma_\theta/\sigma_r)^2$ in the outer region (σ_θ, σ_r are the velocity dispersions in meridional and radial direction.). Contrary to these models, *dissipative* N-body simulations based on the idea of protogalaxies consisting of inelastically colliding clouds give *negative* anisotropies outside the core (see Figure). This dominance of circular orbits is caused by a combination of an orbit-dependent collision rate and a conservation of a negative anisotropy formed during the early collapse phase. Therefore, measurements of the anisotropy in galaxies can provide a tool for the study of the dissipative processes in the early galactic evolution.

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