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Gravity and termodynamics in globular clusters: new theoretical and numerical developments

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Stellar dynamics - N-body simulations

Summary

New theoretical and numerical developments for glubular clusters (GC) evolution are presented.
A new point of view in solving the Fokker-Planck equation describing the evolution of the stellar velocity distribution of a globular cluster can lead to a different way to obtain the solution and justify the introduction of the effective potential which describes the evaporation of stars due to tidal interactions between the cluster and the hosting galaxy.
Moreover, new results on N-body simulations of isolated clusters without evaporation suggest a unique curve of relaxation before the disruption of the system, like in the case of low values of gravitation potential in the evolution of systems subjected to stellar evaporation. The critical value of the central gravitational potential after that the systems cannot be described by a King distribution function seems to be the same for every cluster and leads to generalized time functions characterizing the behavior of the main physical quantities.

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