Abstract

Gravitation plays a major role in the formation of bounded objects in the universe . For their formation, virialized objects had to overcome the expansion of universe. This can be easily done if they grow from initial overdensities. If we have a model for gravitational collapse, the abundance of virialized objects can give information about the initial uctuation spectrum. Almost all bounded objects like stars are formed inside collapsed, virialized dark matter halos which are condensed out of these initial density uctuations. Current models of structure formation work with the assumption that structure formation happens hierarchically from small, initial Gaussian density uctuations. Formation of dark matter halos and their properties can be studied using N-body simulations as well as analytical models. An important prediction that one can have from hierarchical structure formation is the mass function: i.e., the number density of objects as a function of their mass, M. Shape and evolution of the mass function of bound objects can be predicted using Press-Schechter and Excursion set approach. But the predicted mass function from these models is accurate only at the high mass end. It has been shown that this discrepancy between theory and simulation can be reduced if bound structures are assumed to form from an ellipsoidal rather than from a spherical collapse. In the case of an ellipsoidal collapse, there is an effect of environment on the halos from the local shear, which is not relevant in spherical collapse model