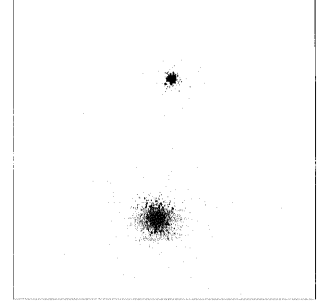


1. Introduction

The evolution of galaxies in clusters are important because even after a cluster is formed, galaxies in the cluster still evolve due to interaction between dark matter halos ,many of which are expected to be hosting galaxies (e.g. mergings, stripping or forming a satellite system due to hyperbolic encounters). The galaxies observed present day are the result of such evolutions. Our study is on the evolution of galaxies due to hyperbolic encounters, between two unequal mass galaxies, which is one of elementary processes of evolution cluster of galaxies. The range of mass ratio is ~ 0.1 . We performed N -body simulations using GRAPE systems.



2. Result

Mass Change in Encounter of two dark halos is plotted in the figures.

horizontal axis: mass ratio m_{cp}/m

vertical axis: relative change in mass $|\Delta m/m|$

lines : $|\Delta m| \propto (\frac{m_{cp}}{m})^1$.

3. Conclusion

From result shown in figures, we express the change in mass of a dark halo through an encounter of another one as

$$\Delta m = k \left(\frac{m_{cp}}{m} \right)^a \left(\frac{p}{r_g} \right)^b \left(\frac{V}{\sigma_g} \right)^c$$

where p , V , r_g and σ_g are impact parameter of the encounter of two galaxies, relative velocity of the encounter, scale radius (e.g., half-mass radius) and velocity dispersion in a galaxy, k is a coefficient. Using systematic numerical experiments, we determined (a, b, c) .

$$(a, b, c) = (1, -2, -3)$$

Here, b and c are determined by Funato and Makino (1999, APJ, 511, 625).

