K02a   Determination of Two-Body Relaxation Time in an Expanding Universe

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We determined the relaxation time in an expanding universe which is the time scale for the cumulative effect of galactic encounters to deviate the galaxy 90 degrees from its theoretical orbit. The deflection time is derived by assuming that interacting galaxies are represented by two-point masses. We applied this model in the Einstein de Sitter universe.

We found that the relaxation time in the expanding universe is proportional to v^7 where v is the initial velocity in the comoving coordinate. When the initial velocity is very large, the relaxation time in the expanding universe has a form similar to the relaxation time in the non-expanding universe.