

B30c GRAPE クラスターを利用する並列 SPH コード

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A so-called “angular momentum problem” is a biggest problem in formation modeling of disk galaxies. This problem arises when we numerically model the collapse of baryon within a dark halo. The formed baryonic disk has much less angular momentum than observed disk galaxies due to the considerable loss of angular momentum during the progressive merger of small clumps. As a result of efficient radiative cooling, the gas component collapse too deeply within the dark halo. When two such halos are merging, the angular momentum of the material near the center is effectively transported to the outside by the tidal force. This is a physical reason for this problem, however, there may be a numerical origin due to its nature of the Smoothed Particle Hydrodynamics (SPH) method widely used when we model the galaxy formation. To address the numerical origin of “angular momentum problem” with much higher resolution SPH model, we are developing a Parallel Tree-SPH code using the GRAPE system in NAOJ. In this presentation, we will present the detailed implementation of the code and show test results with a special attention to the numerical resolution.