Various numerical experiments have proven that the code can handle the expanding low density regions very well as well an conserve the total energy very accurately.

KINEMATIC EVOLUTION OF THE UNIVERSE WITH DARK MATTER

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We performed kinematic tests of the universe with dark matter such as relativistic particles, nonrelativistic particles, and cosmological constant. They were introduced to solve discrepancies between inflation theories ($\Omega_0 = 1$) and observations ($\Omega_0 = 0.2 \pm 0.1$) with respect to the density parameter Ω_0. It is found that the cosmological constant has great influence on kinematics of the universe. If we assume time variable (decreasing) 'cosmological constant', it is shown positive role for the growth of the density fluctuation.

HYBRID GALAXY FORMATION

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A simple approximate form of the present δ-spectrum for the hybrid (HDM + CDM) scenario is used to compute r.m.s. fluctuations in the mass ($\delta M/M$), the peculiar velocity V_p and the background temperature ($\delta T/T$). The results show no significant changes as compared with those of single component scenario, which seems to support the currently favored CDM dominated galaxy formation.

우주상수가 0이 아닌 우주에서의 중력렌즈의 통계적 성질

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지금까지 발견된 중력렌즈계 중에서 렌즈와 광원의 적색이동값이 알려져 있는 3C324, Q0142-100, Q2237+030을 이용하여 0 이 아닌 우주상수를 포함하는 네가지 경우의 평평한 우주론적 모델에 대하여 상의 분리각 분포를 계산하였다. 렌즈의 모델로는 singular isothermal sphere를 사용하였고, 균질하고 등방적인 Friedmann-Lemiatre-Robertson-Walker우주를 가정하였다. 이 모델들에서 렌즈의 광원의 적색편이가 고정된 경우, Schechter luminosity function을 따르는 렌즈은하(lensing galaxies)들에 의해 여러 개의 상이 생길 때 이들 상의 분리각의