

THE TRUE SURFACE MASS DENSITY OF COLD DARK MATTER HALOS

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INTRODUCTION

While the cold dark matter (CDM) scenario generically predicts triaxial dark matter halos with substructure, spherical models with smooth density profiles are nonetheless routinely adopted in the modeling of light propagation effects through such objects. The most popular spherical model during the last decade has been the NFW density profile (Navarro et al. 1996).

In our current study, high-resolution, dissipationless N-body simulations are used to study the surface mass density (Σ) of dark matter along random lines of sight through CDM halos. By comparing the results to the corresponding surface mass densities obtained from smooth and spherical NFW-fits to the halos, the errors in projected mass density introduced by using such simplified models are assessed.

halos and subhalos. From each simulation box, we use the halos which contain more than 100 000 particles. These halos typically contain an order of 100 subhalos and have a mass range of $10^{12} - 10^{14} M_{\text{sun}}/h$.

box = 10 Mpc
z = 0.250

