



Contribution ID: 90

Type: **not specified**

More accurate dark matter density profiles using dynamical information

Monday 28 August 2023 15:25 (25 minutes)

The distribution of dark matter within halos can reveal key information about cosmology. Therefore, making the density profiles increasingly more precise is fundamental for the study of dark matter. We introduce a new dynamics-based method to calculate dark matter density profiles from halo simulations. Each particle in a snapshot is ‘smeared’ over its orbit to obtain a profile which is averaged over a dynamical time. The profiles calculated using this technique are in very good agreement with the traditional ‘binned’ estimates and show significant reduction in Poisson noise for the same number of particles. Including information about the dynamics of the particles also allows for more precise calculation of the gravitational potential down to the softening length of the simulation. This, in turn, makes it possible to extrapolate the shape of the dynamical density profiles at very small radii, which shows promising results when compared to a higher resolution version of the same snapshot. (C. Muni, A. Pontzen, et al in prep)

Presenter: MUNI, Claudia

Session Classification: Parallel