

The universal density profile of the central region of dark matter haloes

Wednesday, 26 September 2012 16:30 (20 minutes)

We consider the density profile of the central region of dark matter haloes. It turns out that under very general conditions the profile is universal: it depends almost not at all on the properties of the initial perturbation and is very akin, but not identical, to the Einasto profile.

We estimate the size of the ‘central core’ of the distribution, i.e., the extent of the very central region with a respectively gentle profile, and show that the cusp formation is unlikely, even if the dark matter is cold. We also indicate that the density profile of the outer part ($r > 0.5R_{vir}$) of the haloes significantly depends on the initial conditions and should not be universal, in contrast to the central area. All these results can be useful both to indirect search of the dark matter and to N-body simulations of the structure formation.

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Session Classification: Parallel Session 2: Cosmology & Astroparticle Physics

Track Classification: Cosmology & Astroparticle Physics