



Can Tides Disrupt Cold Dark Matter Subhaloes?

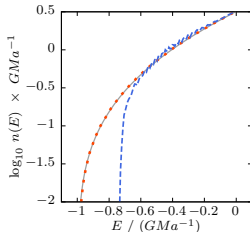
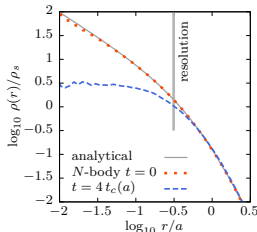
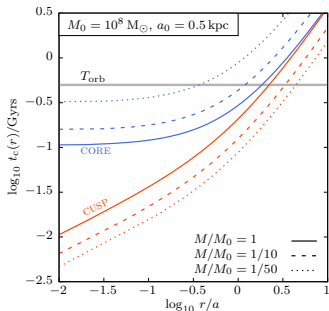
Raphaël Errani

Tidal evolution of dynamical times $t_c(r)$

- Dehnen $\{\alpha, \beta, \gamma\}$: **cuspy** $\{1, 4, 1\}$
core $\{1, 4, 0\}$
- tidal tracks for evolution of halo structural parameters (E+18)
- cuspy haloes**: i) $t_c(r) \rightarrow 0$ for $r \rightarrow 0$
ii) region that reacts adiabatically **increases** with tidal stripping
- cored haloes**: i) $t_c(r) \rightarrow \text{const} > 0$
ii) region that reacts adiabatically **shrinks** with tidal stripping

Artificial core formation

- a cuspy subhalo forms a density core on the scale of the spatial resolution of the simulation

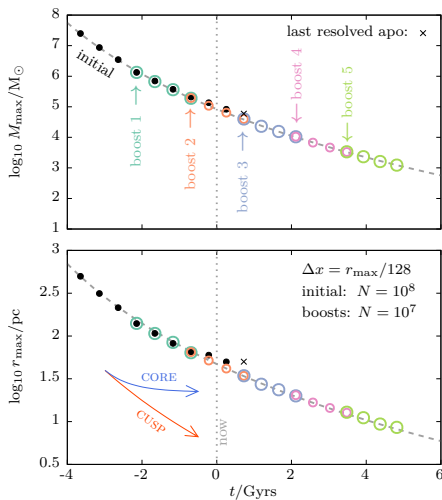


Cusp reconstruction in simulations

- we periodically reconstruct the density cusp during the simulation, fitting profiles with $\gamma = 1$ to the tidally stripped subhalo (*boosts*)
- this allows us to follow the tidal evolution of a (cuspy) subhalo for arbitrarily large fractions of tidally stripped mass
- dark matter subhaloes with cuspy density profiles cannot be completely disrupted by smooth tidal fields**

Micro galaxies

- by embedding stellar tracers in cuspy subhaloes, we show that dwarf galaxies can be stripped to sub-solar luminosity without tidal disruption



RE & J. Peñarrubia (2019), arXiv:1906.01642