

Gravothermal evolution of galactic dark matter halos with velocity-dependent self-interactions

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The evolution of galactic dark matter halos would be modified if dark matter were self-interacting. The early heat conduction from the halo envelope to the core would enlarge the core size and reduce the central cusps. The late heat conduction from the core to the envelope would collapse the core into a singular state. Previous studies have focused on constraining the velocity independent self-interaction from the gravothermal evolution of the dark matter halo. In this talk, we investigate the velocity dependent scenario, including both power-law and non-power-law velocity dependence. The latter case satisfies all astrophysical constraints.

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