Milky Way Mass Profile from Satellite Dynamics

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Satellite dwarf galaxies: Best tracer for MW outer halo

Information from simulations can bypass the model dependence in conventional methods.

Similarity of halo internal dynamics
⇨ **Empirical Model** for 6D phase-space distribution of satellites from simulations

$$p\,(r, v \mid M, c) \equiv f\,(E, L \mid M, c)$$

Observational errors & selection function are treated rigorously with Bayesian statistics

Method comparison with mocks
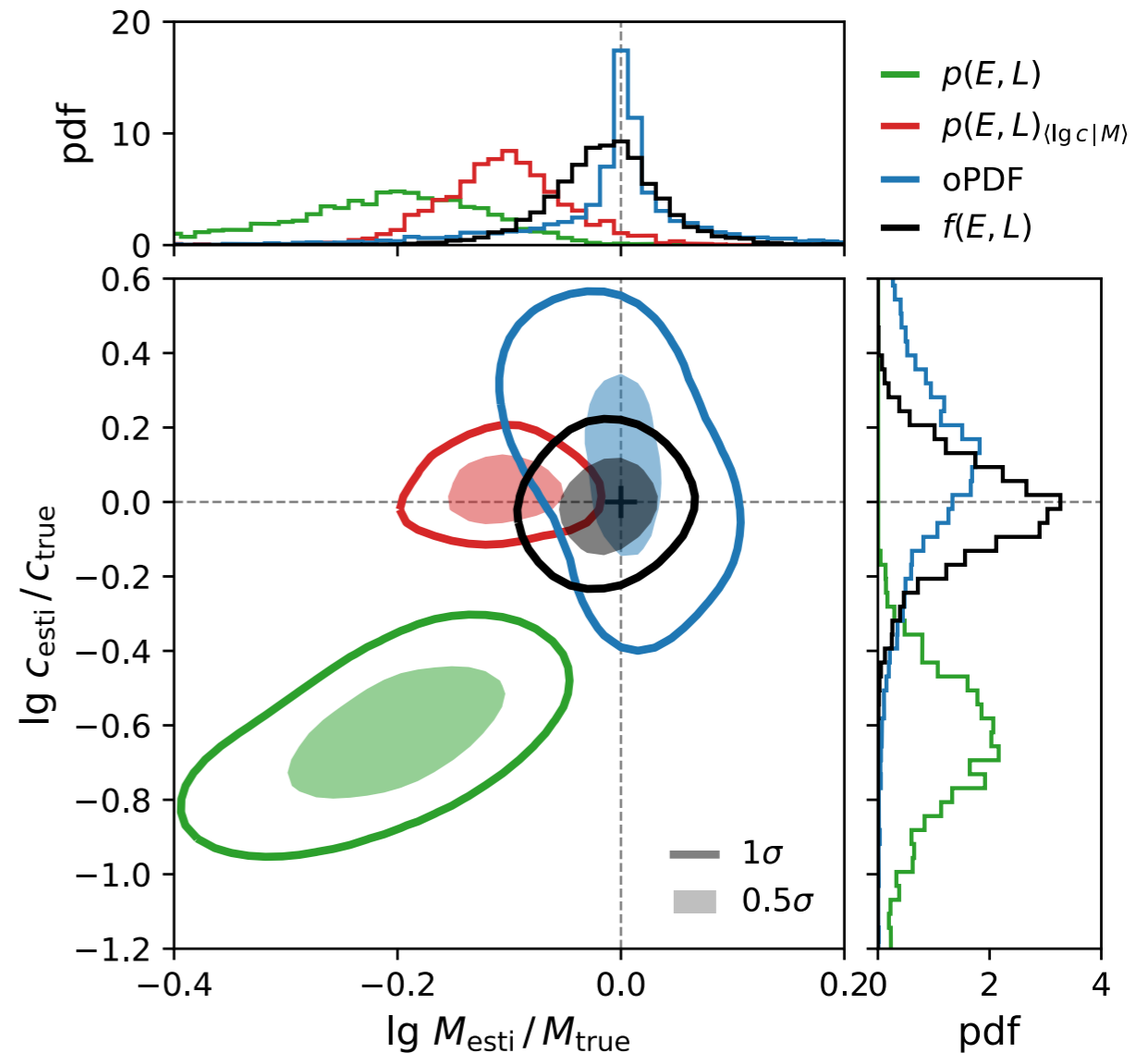
More **accurate** and **precise** than methods merely based on Jeans theorem (Han+ 2016) or orbital distribution (Li+ 2017)
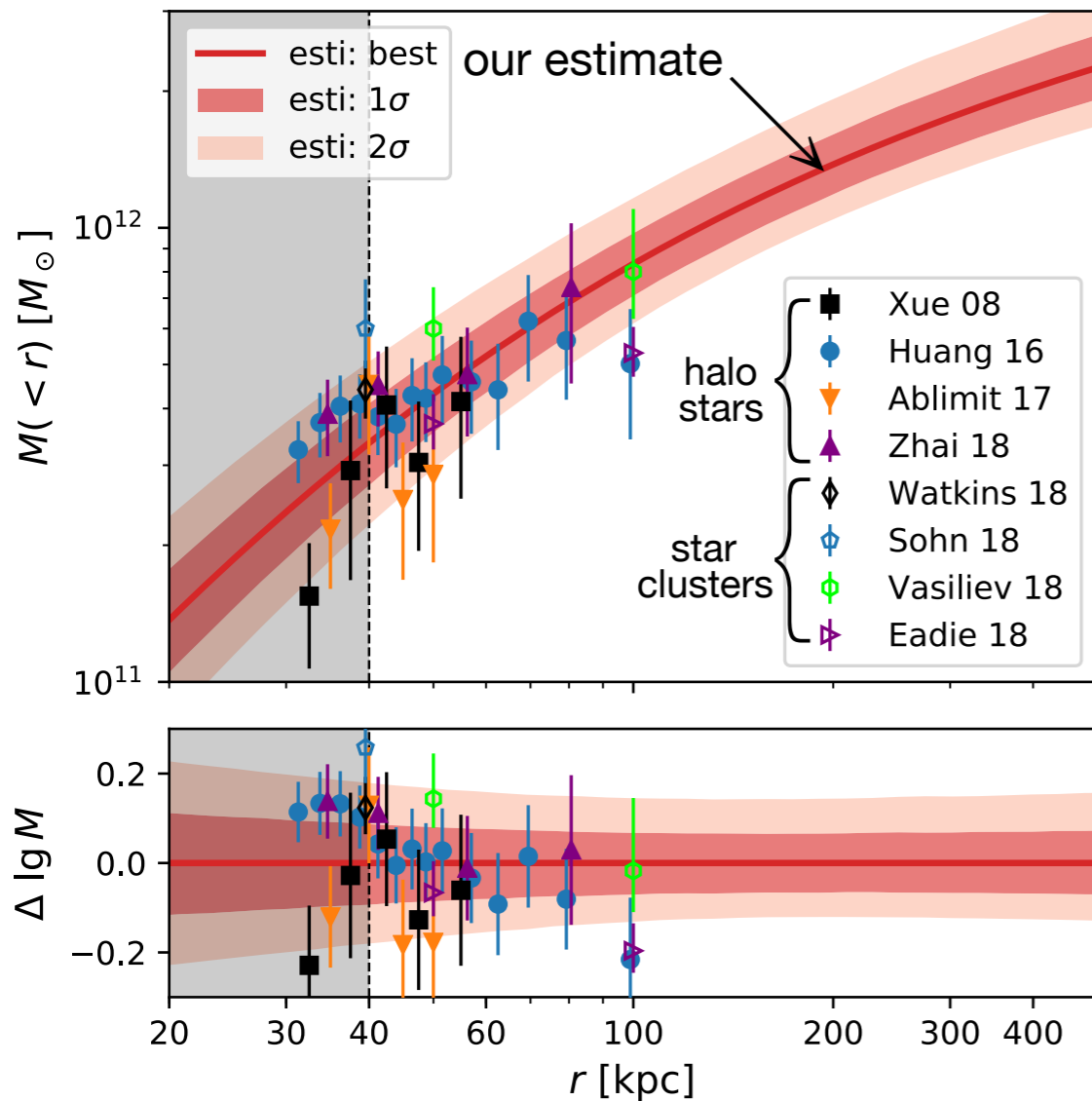
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Mass profile from satellites
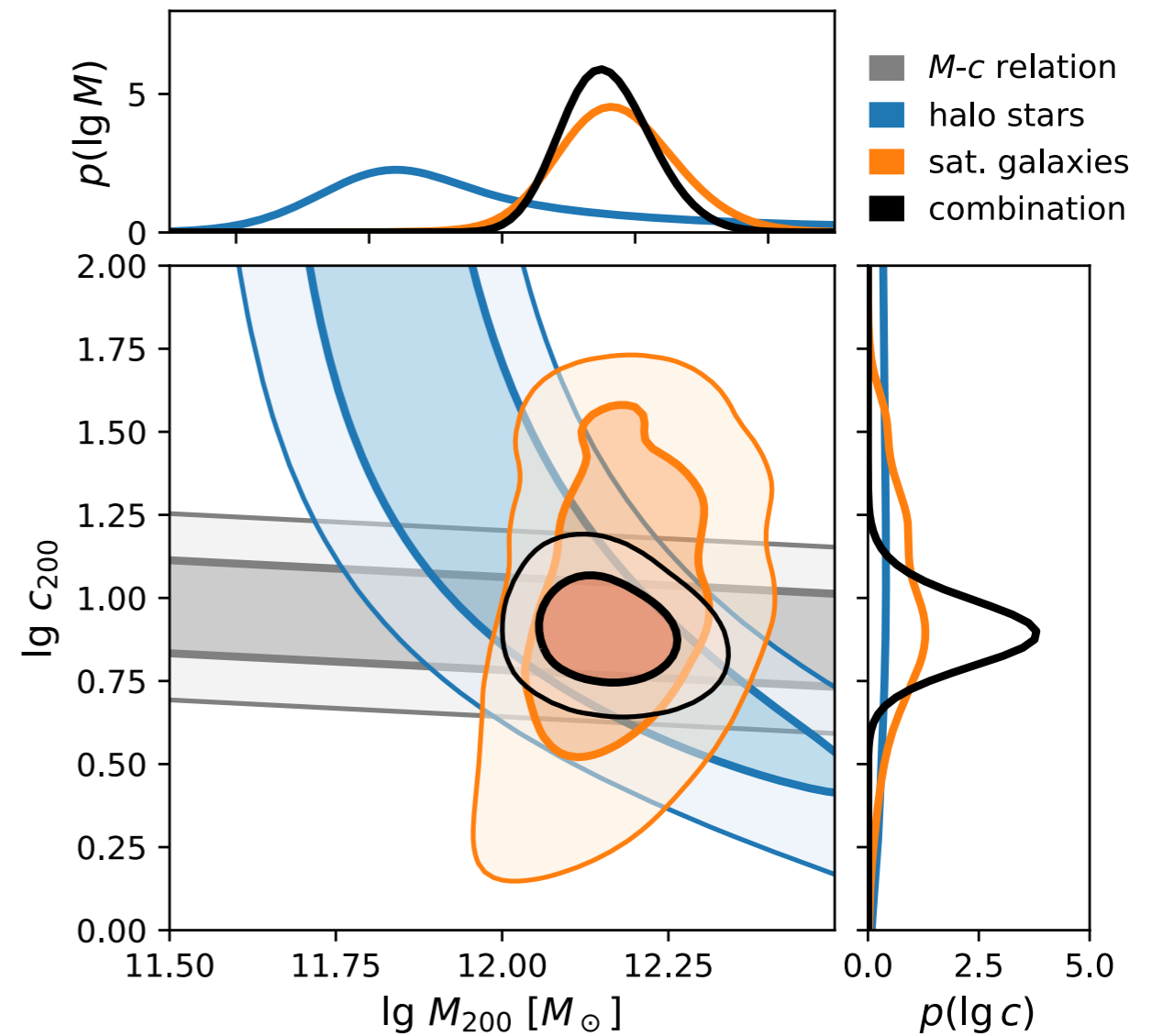
Multiple tracer populations

28 satellites in [40, 300] kpc with Gaia data

$$\Rightarrow M = 1.50^{+0.32}_{-0.26} \times 10^{12} M_\odot \,,\; c = 8.1^{+2.7}_{-2.0}$$

Current **BEST** estimation, also consistent
with previous measurements to MW profile

Satellite Galaxies
    ⇨ Total halo mass

Satellites + Stars
    ⇨ Better concentration