

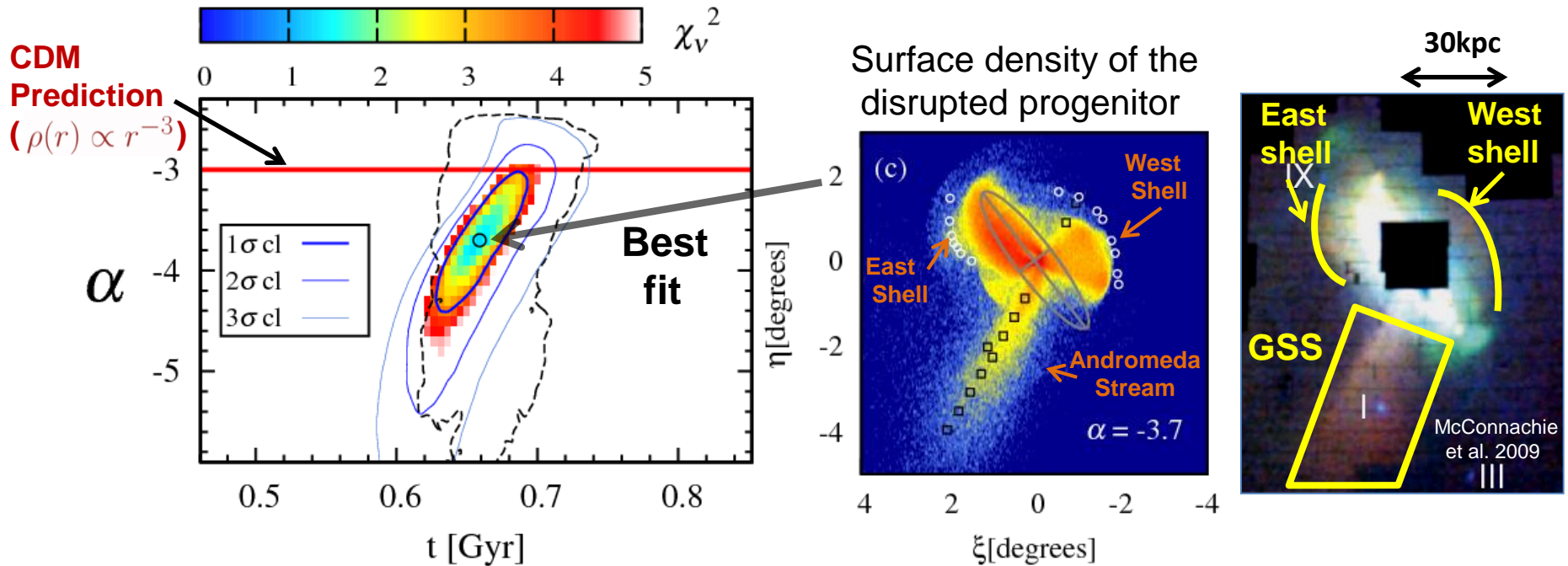
A new Puzzle of the Cold Dark Matter Prediction in the Outer Density Profile of the Andromeda Galaxy

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Recent studies have predicted that **CDM halos have a universal mass-density profile** with the outer profile of $\rho(r) \propto r^{-3}$.

To examine this prediction, we simulate a galaxy collision in M31 with the DM halo profile of

$$\rho_{\text{DMhalo}}(r) = \rho_{s,\alpha} x^{-1} (1 + x)^\alpha + 1, \quad x = r/r_{s,\alpha}.$$



Outer density profile of the DM halo of M31 is **steeper than that of the CDM prediction**