Dissecting Two-halo Galactic Conformity Effect for central galaxies

Kai Wang, Yingjie Peng & Yangyao Chen (arXiv: 2304.06886)

Two-halo Galactic Conformity Effect is the **spatial** correlation of **central galaxy properties** out to **several Mpc**.

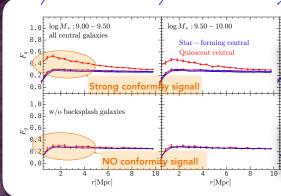
For example,

the **central galaxy quiescent fraction** around quiescent central galaxies is **higher** than that of star-forming central galaxies, and such quiescent fraction excess **extends to several Mpcs**.

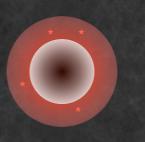
Reference:

♦Wang et al. (2304.06886)
♦Kauffmann et al. (1209.3306)
♦Kauffmann (1508.02400)
♦Ayromlou et al. (2207.02218)
♦Sin et al. (1702.08460)
♦Lacerna et al. (1703.10175)
and reference therein...

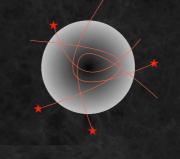




alaxy WHAT modulates the quenching of central galaxies across several Mpc scale?



Ram-pressure stripping takes effect out of the virial radius and these central galaxies are quenched before they fall into the halo. Ayromlou et al. (2207.02218)



Massive halos/clusters are surrounded by backsplash galaxies, which are previous satellite galaxies that get ejected out of the halo. Wang et al. (2304.06886)



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Our analysis in TNG supports this one

Strong conformity signal, manifested as higher central galaxy quiescent fraction around quiescent central galaxies, with backsplash galaxies included.

Powerful AGN feedback heats the gas

out to several Mpcs, thus suppresses

the star formation activity in these

surrounding central galaxies.

Kauffmann (1508.02400)

NO conformity signal, as the quiescent fraction of surrounding central galaxy is *independent* of primary galaxy, with backsplash galaxies excluded. Quiescent fraction of central galaxies around $10^{13}\ensuremath{M_{sun}}\xspace$ halos.

Excessive quenching mainly from backsplash central galaxies.

NO excessive quenching from non-backsplash central galaxies around massive halos.

