PROCEEDINGS OF SCIENCE

# The Baryonic vs Dark Matter Halo Mass Relationship in Galaxies: the effect of the inefficiency of the cosmological star formation

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We weigh the baryonic and the total mass density of galaxies by means of their inner kinematics and find that these systems have retained only less than 1/9 of their primordial HI content by transforming it in stars or by arranging it in gaseous disks. This value matches that obtained by integrating the star formation occurred over the whole Hubble time, and traced by the galaxies' IR and UV fluxes at different redshifts. This well supports the claim that the missing baryons are atoms that never have been in a star and presently are unbound to galaxies. From the Baryonic Mass Function of galactic structures and the theoretical Halos Mass Function of virialized objects, we obtain the baryonic mass vs galaxy virial mass relationship, a crucial benchmark for theories of galaxy formation. Such a relation describing the effect of feedback on the galaxy formation process, provides also a meaningful route to relate the fundamental properties of the dark and the ordinary matter.

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