THE GALAXY HALO-CONNECTION: SCALING RELATIONS

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OBJETIVE

Mapping the stellar-to-halo mass relation in the scaling relations

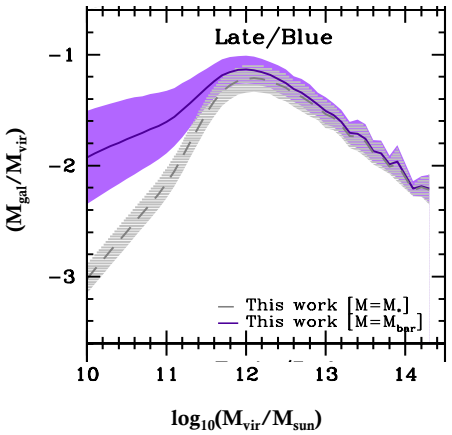

Figure 2. Stellar-to-halo (gray line and shaded area) and baryonic-to-halo (purpure line and shaded are) mass relations for the two galaxy populations and the density-weighted average of them.

Rodriguez-Puebla et al. (2014)
Calette et al. (2015)

METHODS

The mock catalog

The static model: A disk in centrifugal equilibrium is inserted in a ΛCDM halo (Mo et al. 1998), including generalized **adiabatic invariance** (Gnedin et al. 2004), secular **bulge formation** and gas transformation into stars (Toomre criterion).

Generation of a disk galaxy catalog: We generate a total of 40,000 mock galaxies following a uniform halo mass distributions in bins of *0.1 dex* in $log_{10}M_h$ in the mass range 10^{10} to 10^{14} $M_\odot$. For each halo mass bin, we assign the input parameters λ, C, f_{bar}, by taking them randomly from their corresponding distributions and we perform 1000 extractions. For each M_h and the set of initial conditions taking from their corresponding distributions, we apply the static model of disk galaxies in centrifugal equilibrium inside ΛCDM halos.

RESULTS

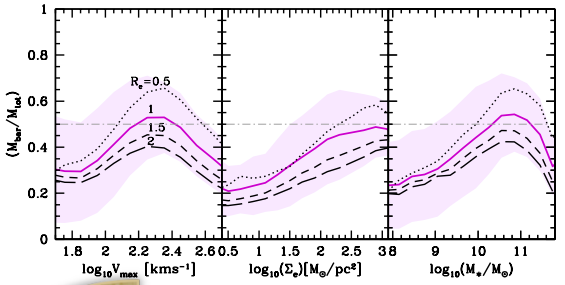

Figure 7. Baryon-to-total mass ratio at a given radius, M_{bar}/M_{tot}, of the semi-empirical galaxies as a function of V_{max}, Σ_e and M_*. The solid lines and shaded areas are for measures of this ratio at 1 R_e (the means and the standard deviations, respectively). The dashed lines, from top to bottom, are the means of the M_{bar}/M_{tot} ratio measured at 0.5, 1.5 and 2.5 R_e, respectively.
Mancillas et al. (in prep.)