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Abstract

Non-axisymmetric features (such as bars and spirals) as well as general triaxialities (such as those of the bulge and halo) drive the dynamical and secular evolution of disk galaxies by exerting gravitational torques which redistribute mass and angular momentum. While most (> 70 %) spirals are barred in the local Universe, early studies of the HDF suggest a remarkably low bar fraction (< 10 %) at intermediate redshifts. If confirmed, this result would imply that the dynamics and evolution of disks at intermediate redshifts are fundamentally different from present-day spirals. With the overall goal of constraining the dynamics, evolution, and mass assembly of disk galaxies, we have started a study based on the Great Observatories Origins Deep Survey (GOODS) ACS BViz images and numerical modeling, aimed at estimating the fraction and properties of bars/spirals/asymmetries, the central mass concentration, and the level of activity in disk galaxies out to z 1. The GOODS ACS data provide improved resolution, a larger field of view (10'x16' per field), a factor of at least 10 improvement in number statistics, and better wavelength coverage compared to the WFPC2 HDF data used in earlier studies. We illustrate techniques for bar and asymmetry identifications from studies of local galaxies , as well as intermediate redshift spirals. We show preliminary analysis of the disk/bar properties, central mass concentrations and level of star formation. We present a new method and first results to analyze stability of bars embedded in massive halos of various central concentrations and asymmetries.

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