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CHARACTERIZATION OF ISOLATED GALAXIES IN THE LOCAL UNIVERSE FROM SDSS (DR5)

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We present preliminary results on the morphological characterization of a new catalog of isolated galaxies obtained through an automated search in the Sloan Digital Sky Survey Data Release 5 (SDSS DR5). 1600 isolated galaxy candidates were found in $\simeq$ 1.4 strad of sky in the (SDSS DR5) photometry. Our selection criteria, including a refined version of that in Karachentseva (1973), use a stronger isolation based on available redshift information. A deep and uniformly observed sample of isolated galaxies is aimed for various purposes including (i) comparative studies of environmental effects, (ii) confronting model predictions of galaxy evolution and (iii) evaluating the change of galaxy properties with redshift.

A morphological classification of these new cataloged galaxies is being carried out with emphasis on structural features like bars, rings and global disturbances in the Spirals as well as on fine structure in the Elliptical/Lenticular candidates. To this purpose, an image processing pipeline that allows us to visually check the morphology in *ugriz* bands through their transformed and sharp-filtered images has been implemented. In addition, we use a detailed surface photometry analysis to complement our morphological classification. Recent observational studies (Eskridge 2000; Hernández-Toledo et al. 2007a,b) conclude that about (50–70%) of the spiral galaxies in the local universe have barred structure.

In Figure 1, we present a mosaic of images of the cataloged isolated galaxy I-414. The left panel shows an original g-band image, the middle panel shows a sharp-filtered version of the g-band image and the right-most panel shows an RGB image from the SDSS Database. Note how our image processing pipeline let us unravel morphological details like bars and rings.

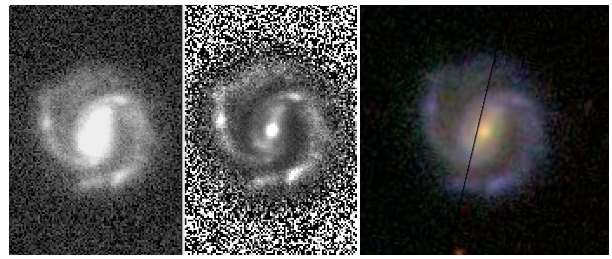

Fig. 1. A mosaic of the catalogued isolated galaxy I-414. Left panel: the original g-band image. Middle panel: a sharp-filtered version of the g-band image. Right-most panel: an RGB image from the SDSS Database.

A fundamental issue in galactic evolution is the relative importance of initial conditions versus environment. To address the role of noncluster environments, we present a new catalog of isolated galaxies in the SDSS DR5 data. This catalog will offer a sample of galaxies that can greatly aid in the investigation of galaxy evolution and galaxy formation.

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