

A New Catalog of Isolated Galaxies

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We present a new catalog of isolated galaxies (coined as *UNAM-KIAS*) obtained through an automated systematic search. The 1520 isolated galaxies were found in ~ 1.4 steradians of the sky in the Sloan Digital Sky Survey Data Release 5 (SDSS DR5) photometry. The selection algorithm was implemented from a variation of the criteria developed by Karachentseva (1973), with full redshift information. This new catalog is aimed to carry out comparative studies of environmental effects and constraining the currently competing scenarios of galaxy formation and evolution.

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. For 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.

After a characterization of the *UNAM-KIAS* catalog, we find: (1) The galaxies are of morphological types from E to Sm. We tentatively find evidence for barred structure in about 62.9% of these isolated galaxies. (2) The redshift distribution of this sample suggest that (a) it is a deep enough sample and (b) it is homogeneously distributed in space. (3) The catalog is a magnitude-limited sample that is reasonably complete ($\sim 85\%$) up to 15.2 mag in *r*-band, providing strength to the statistical significance of any studies of the galaxies in isolated environments. (4) Finding uniformly selected reasonably nearby isolated galaxies with detailed morphological information is of high relevance. The *UNAM-KIAS* catalog will provide a unique database that can be used for several studies, including (a) studies of the environmental effects on galaxies belonging to groups and clusters, and (b) for confronting theoretical and model predictions of galaxy evolution. The *UNAM-KIAS* catalog is published by Hernández-Toledo *et al.* (2009).

References

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