

Galaxy mergers as a function of environment. Using the structural parameters of residual images

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Abstract

We present a new way to estimate the merger fraction of galaxies using the morphological parameters of galaxies. The merger fraction is the fraction of galaxies involved in a merger episode in some parent population, which is usually a mass limited sample obtained via deep images of the sky. The sample we use is a mass limited sample ($\log M/M_{\odot} > 9.0$) obtained from the STAGES(Space Telescope A901/02 Galaxy Evolution Survey) HST/ACS F606W images of the A901/02 supercluster ($z = 0.165$). This sample includes 719 galaxies in the cluster and 453 galaxies in the field, of all morphological types. The main contribution from this work is that this is the first time in which the structural parameters of the residual images, after the subtraction of a smooth Sérsic model of the more luminous actor in the merger are explored. It results that the structural parameters of the residuals can indeed produce a good merger sample, with a better statistical quality than samples obtained using the morphological properties of the direct images. In particular, the Gini index of the residuals is a very reliable merger diagnostic. The merger fraction is lowest in the very central regions of the cluster, and is very similar both in the field and in the outskirts regions of the cluster.