X72a   A Machine-Learning Based Approach for Merger Identification in Subaru HSC

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Galaxy interactions and mergers are widely accepted as a key to be the pathway for galaxy evolution in the current framework for structure formation and evolution, and are associated with various processes pertaining to galaxy evolution. For example, galaxy interactions and mergers have shown to accelerate the accretion of gas onto supermassive black holes and the subsequent ignition of active galactic nuclei (AGN). However, the relative role of galaxy interactions as a driver of AGN activity is not yet well-constrained, due to the lack of a sufficiently large data sample. To tackle this issue, we have developed a random forest classifier to classify galaxies according to merger status, which we have used to create a merging and control sample of robustly classified AGN/non-AGN hosts in the Subaru-HSC catalogue. The random forest is trained using galaxy morphological parameters such as the CAS parameters (Conselice 2003), which we generated through the use of GaLight (Ding et al. 2021), a pipeline to produce high-quality quantitative morphologies. We will compare the performance of our classifier with other machine-learning based methods. We will also discuss future prospects, where we anticipate the expansion of our classifier to all of HSC, and further investigations, such as the investigation of the role that mergers play in driving AGN activity.