

X43a Quantitative investigation of the impact of mergers in AGN activity in HSC-SSP

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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 mergers in AGN activity is still unclear, therefore further investigations are required to improve our understanding of both mergers and AGNs. To create a merger sample, we use fine-tuning, which is a transfer learning-based approach. Transfer learning is an approach where the weights of a pre-trained model are re-used for a new problem, allowing for higher performances even with smaller training datasets. Fine-tuning uses the pre-trained model as a base, but with new output layers trained for the new problem. For our classification problem, we fine-tune using Zoobot (Walmsley et al. 2022), a pre-trained model trained on galaxy images, for merger classification of several million galaxies in the Subaru-HSC catalogue. Using these classification labels, we conduct quantitative investigations on the role that galaxy mergers play in AGN activity, such as comparing the AGN incidence between mergers and non-mergers. We also conduct further investigations, such as investigating the environmental dependence of AGN activity.