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Using Machine Learning to Study Quenching Modes of Galaxies through Spatially Resolved Data from HSC and MaNGA

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The Hyper Suprime-Cam (HSC) offers high-resolution, wide-field imaging of the Universe. We explore the application of machine learning methods, specifically DEmP (Hsieh et al., 2014) and Convolutional Neural Networks (CNN), to predict spatially resolved stellar mass and star formation rate maps from HSC-SSP 5-band photometry using approximately 800 overlapping galaxies with MaNGA survey. We then employ a non-parametric method (Lin et al., 2019) to classify galaxy quenching modes as inside-out or outside-in, validating our approach. This work compares the machine learning-based results with those from MaNGA, demonstrating the efficacy of our method. Finally, we discuss potential applications of this technique to other large imaging surveys, such as LSST and Euclid, highlighting its significance in advancing our understanding of galaxy evolution.

Section

Galaxy/Extragalactic

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