

Z131a A study of recently quenched galaxies in preparation for PFS survey

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Quenching is the process where galaxies suppress their star formation activities, which is critical for galaxy evolution. Recently quenched galaxies (RQGs), as a transitional population between quiescent and star-forming galaxies, can efficiently deliver information of quenching processes. In this work, we try to understand the quenching and its mechanism through study of RQGs.

A statistical sample of RQGs is necessary for studying mass and environment dependence of quenching. However, the rarity and sparseness of RQGs hampers statistical spectroscopic analysis. PFS will be an ideal solution for this problem. As a pilot work, we conduct a statistical photometric study of RQGs. Using the rest-frame UVJ diagram, we select RQGs from the centre to the outskirts of X-ray detected clusters and groups at redshift 0.5-1.5 and divide them by the quenching timescale. This method is preliminarily confirmed by existing spectra. We also conduct analysis on photometrically selected RQG candidates. We find that quenching depends on stellar mass at all redshift, while environmental dependence only appears at $z < 1.0$. We further investigate galaxy structure using HST images. We find that RQGs with different quenching timescales show different behaviors in structure transformation, indicating they are driven by distinct mechanisms.

The upcoming PFS' will enable us to carry out a spectroscopic survey of RQGs. Its large FOV can significantly improve the efficiency of survey. With statistical RQG spectroscopic data, we can interpret the quenching scenario better.