

T01a Morphological Butcher-Oemler effect in the SDSS Cut & Enhance Galaxy Cluster Catalog

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We present an analysis of fractions of late type cluster galaxies as a function of redshift using 365 clusters ($0.02 < z < 0.3$) selected from the SDSS Cut & Enhance galaxy cluster catalog. We analyze the fraction of late type galaxies in four independent ways using: restframe $g - r$ color, $u - r$ color, galaxy profile fitting and concentration index. The first corresponds to the one used in the classical Butcher-Oemler analyses. The last three are more sensitive to the morphologies of galaxies. In all four cases, we find an increase in the fraction of late type galaxies toward increasing redshift with greater than a 99.9% significance level. The results show cluster galaxies do, in fact, change colors as has been seen in the Butcher-Oemler effect. In addition, they change their morphology toward higher redshift as if showing a morphological equivalence to the Butcher-Oemler effect. The underlying physical mechanism is unknown. Our results, however, favor the mechanisms that affect the gas supply (e.g. ram-pressure stripping, galaxy infall) rather than dynamic processes such as harassment, interaction/mergers, or gas depletion through enhanced star formation. We also find a slight tendency of richer clusters having lower values of late type fractions. The trend might provide possible evidence of a ram pressure stripping, where a richer cluster has a larger effect from ram pressure due to its higher temperature.