

A Search for Young Stars in the S0 Galaxies of a Super-Group at $z=0.37$

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We analyze GALEX UV data for a system of four gravitationally-bound groups at $z=0.37$, SG1120, which is destined to merge into a Coma-mass cluster by $z=0$, to study how galaxy properties may change during cluster assembly. Of the 38 visually-classified S0 galaxies, with masses ranging from $\log(M_*) \sim 10-11$, we detect only one in the NUV channel, a strongly star-forming S0 that is the brightest UV source with a measured redshift placing it in SG1120. Stacking the undetected S0 galaxies (which generally lie on or near the optical red-sequence of SG1120) still results in no NUV/FUV detection (<2 sigma). Using our limit in the NUV band, we conclude that for a rapidly truncating star formation rate, star formation ceased *at least* ~ 0.1 to 0.7 Gyr ago, depending on the strength of the starburst prior to truncation. With an exponentially declining star-formation history over a range of time-scales, we rule out recent star-formation over a wide range of ages. We conclude that if S0 formation involves significant star formation, it occurred well before the groups were in this current pre-assembly phase. As such, it seems that S0 formation is even more likely to be predominantly occurring outside of the cluster environment.

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