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# Three-Dimensional Spectroscopy and Star Formation Histories of Field E+A Galaxies

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**Abstract.** We present the initial results of an integral field spectroscopic survey of E+A galaxies in the field, which combined with radio continuum measurements and multi-wavelength photometry and imaging provides significant insight into the dynamical and star formation histories of these transitioning post-starburst systems. We focus on the E+A galaxy known as G515 ($z = 0.088$), a massive merger remnant that began its star formation quenching process ∼1.0 Gyr ago. Its relatively young stellar population contrasts with its light profile and kinematics, which are more consistent with a slowly-rotating, early-type galaxy.

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E+A (i.e., post-starburst or 'k+a') galaxies represent some of the best examples of a system whose star formation is on the verge of being quenched. Thus, they can be valuable signposts of an important but poorly understood process of galaxy evolution. We present the first results of integral field spectroscopy and radio continuum measurements of a sample of E+A galaxies in the field with redshift $0 < z < 0.2$, with the goal of examining the properties of this significant evolutionary phase. We focus particularly on J152426.55+080907 at $z = 0.088$, also known as 'G515' or 'Flagellan,' for which more than 20 years of spectroscopic data are available (Liu *et al.* 2007). On several-kpc scales, its optical light is dominated by stellar populations varying in age from 0.5 to 1 Gyr. Optical line emission, particularly in [OII], also appears to be highly variable in both intensity and spatial location. We also see substantial evidence of outflows; and multi-epoch radio observations show weak and significantly variable radio continuum emission, possibly indicative of an AGN nearing the end of its duty cycle. On the other hand, 3-D spectroscopy of G515 obtained with the Sparsepak and Hexpak IFUs at the WIYN telescope at Kitt Peak show that its light profile and kinematics are more typical of a "slow rotator" early-type galaxy. This is perhaps surprising, given its recent merger activity and observed levels of subsequent evolution.

Our results indicate that E+A galaxies apparently do not always fade gradually from "star-forming" to "quenched" states. Rather, they may cease their activity unevenly, in fits and starts, evolving rapidly over very short timescales.

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## Reference

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