

Star Formation History of Early-Type Galaxies with Tidal Debris in the S^4G

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Abstract. Local early-type galaxies (ETGs), despite typically being associated to old stellar populations and passive evolution, have been in some cases observed to present peculiarities in their stellar structure, like disks and shells (e.g., Kormendy *et al.* 1997, Rix, Carollo & Freeman 1999). Moreover, it has been observed that ETGs with such tidal features may present UV emission (Rampazzo *et al.* 2007, Salim & Rich 2010). These properties make them relevant constraints to galaxy formation models. We are analysing the structure of nearby ETGs observed in the Spitzer Survey of Stellar Structure in Galaxies (S^4G ; Sheth *et al.* 2010), which comprises the largest mid-IR survey of galaxies in the local Universe. We perform a 2D GALFIT decomposition of the $3.6\mu\text{m}$ images of 146 ETGs and examine their residual images. We identify tidal features in 17% of these, suggesting that a non-negligible ETGs fraction may have experienced (after the formation of the bulk of their stellar budget) merger events that have left signatures (Canalizo *et al.* 2007). For 6 of these peculiar ETGs, we also applied GALFIT decomposition to public GALEX/UV and SDSS/optical images. With measurements in multiple bands, we applied SED fitting techniques to estimate star formation rates (SFR) and stellar masses for the galaxies and their tidal features. We find that these 6 peculiar ETGs present masses in agreement with the population of non-peculiar ETGs. However, SFRs are higher than what has been measured for the average ETG population (Shapiro *et al.* 2010, SDSS MPA-JHU catalog). Based on the Kaviraj (2010) relation, we find that for these peculiar ETGs the estimated age of the most recent star formation event is less than 3Gyrs. Despite this indication of recent star formation, we have not found evidence of prominent UV emission in the tidal features (Marino *et al.* 2011). We are currently extending our work to the full sample of peculiar ETGs identified in our sample.

Keywords. galaxies: elliptical and lenticular, galaxies: structure, galaxies: evolution

References

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