

The First UV Fundamental Planes and Evidence of Star Formation in Early-type Galaxies

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We present the *GALEX* (Galaxy Evolution Explorer) far (FUV) and near (NUV) ultraviolet imaging of 34 nearby early-type galaxies from the **SAURON** representative sample of 48 E/S0 galaxies, all of which have ground-based optical imaging from the MDM Observatory. The surface brightness profiles of nine galaxies (26 per cent) show regions with blue UV-optical colours suggesting recent star formation. Five of these (15 per cent) show blue integrated UV-optical colours that set them aside in the NUV integrated colour-magnitude relation. These are objects with either exceptionally-intense and localised NUV fluxes or blue UV-optical colours throughout. They also have other properties confirming that they have had recent star formation, in particular $H\beta$ absorption higher than expected for a quiescent population and a higher CO detection rate. This suggests that residual star formation is more common in early-type galaxies than we are used to believe. NUV-blue galaxies are generally drawn from the lower stellar velocity dispersion ($\sigma_e < 200 \text{ km s}^{-1}$) and thus lower dynamical mass part of the sample. We have also constructed the first UV Fundamental Planes and show that NUV blue galaxies bias the slopes and increase the scatters. If they are eliminated the fits get closer to expectations from the virial theorem. Although our analysis is based on a limited sample, it seems that a dominant fraction of the tilt and scatter of the UV Fundamental Planes is due to the presence of young stars in preferentially low-mass early-type galaxies.