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Quantifying secular evolution through structural decomposition

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Abstract. Structure within a galaxy is not random, instead emerging as a direct function of its evolutionary path. It is thought that secular evolutionary processes leave behind distinct structural tracers in the form of bars, pseudo-bulges and rings. We have developed a robust automated structural analysis pipeline (Kelvin *et al.*, 2012) able to accurately map structure across a range of ground and space-based datasets. Using reprocessed SDSS and UKIDSS data from the GAMA survey: an imaging and spectroscopic survey with over 300, 000 redshifts across 300 square degrees (Driver *et al.*, 2009); we measure the relative abundance and stellar mass locked up within these structures in the local ($z < 0.06$) Universe. Future robust calculations of the stellar mass budget within bulges, bars, disks and pseudo-bulges should allow us to measure the relative importance of secular evolution against other mechanisms across cosmic time.

Keywords. galaxies: evolution, galaxies: structure, techniques: image processing, astronomical data bases: miscellaneous, galaxies: bulges, galaxies: spiral, galaxies: fundamental parameters

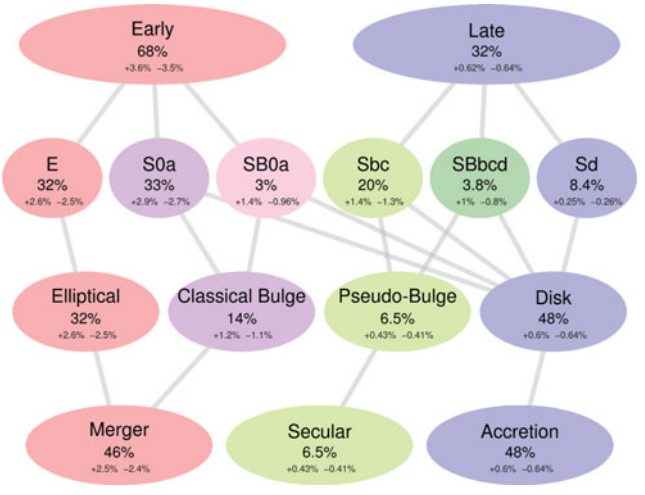

Figure 1. The breakdown of galaxy stellar mass in the local Universe by (top to bottom): morphological type; morphological class; galaxy structure, and; evolutionary processes. Percentages represent the fraction of mass within that division, with 2σ errors shown below for reference.

References

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