

Refining the bimodal distribution of galaxies with ML and GAMA survey

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We present the results of our classifications of galaxy data taken from GAMA survey that is a multiwavelength spectroscopic, imaging and photometric survey of 300 000 galaxies (<http://www.gama-survey.org/>). In our study, we classify a sample of 7338 galaxies using firstly, five measured physical parameters as in Turner et al. (2019) MNRAS, 1, 126 (T19), and secondly, their optical SDSS spectra. The classifications are carried out using an unsupervised method called Fisher-EM (FEM, Bouveyron & Brunet, 2012, Stat. & Comp., 22, 301), that is particularly well-suited to high-dimensional parameter spaces, as is the case of the spectra. Our results show that FEM discriminates much better the resulting classes than the K-means method (used in T19) and is able to better resolve the classical bimodal distribution of galaxies in their parameter spaces. As a matter of fact, we obtain about 20 classes in each classification process for which we propose possible evolutionary paths .