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On the origin of the scatter around the Fundamental Plane

I will present the fundamental plane (FP) analysis of 141 early-type galaxies in the Shapley supercluster at z~0.049.
The key feature of this sample is its coverage of low-mass galaxies down to sigma~50 km/s. The origin of the intrinsic FP scatter is investigated by using estimates of age, metallicity and alpha/Fe. We find that the FP residuals anti-correlate with the mean stellar age in agreement with previous work. However a stronger correlation with alpha/Fe is also found. These correlations indicate that galaxies with effective radii smaller than those predicted by the FP have stellar populations systematically older and with alpha over-abundances larger than average, for their sigma. Including alpha/Fe as a fourth parameter in the FP, the total scatter intrinsic scatter is reduced of about 50%. This result indicates that the distribution of galaxies around the FP are tightly related to the enrichment, and hence to the timescale of star-formation. Our results appear to be consistent with the merger hypothesis for the formation of ellipticals which predicts that a significant fraction of the scatter is due to variations in the importance of dissipation in forming merger remnants of a given mass.