[GC17] Star-forming Galaxies, AGN Host Galaxies, and Early-Type Galaxies in the SDSS: Evolutionary Connection in the Fundamental Plane

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We present a study of the connection of star-forming galaxies, AGN host galaxies, and normal early-type galaxies in the Sloan Digital Sky Survey (SDSS). Using the SDSS DR5 data, we select our early-type galaxy sample in the color vs. color-gradient space, and classify the spectral types of the early-type galaxies into normal, star-forming, Seyfert and LINER classes, using several spectral line flux ratio. We estimate the slope in the fundamental space for each class of early-type galaxies, and find that there are differences in the slopes of the fundamental planes (FPs) among the different classes of early-type galaxies. This may be the first identification of the systematic variation of the FP slope among the sub-classes of early-type galaxies. We discuss the possible origins of the FP slope variation.

[GC18] Intrinsic Shapes of Early-type galaxies

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Using a 3922 volume-limited sample from Sloan Digital Sky Survey Data Release 5, we investigate the intrinsic axis ratio distribution (ARD) of early-type galaxies with respect to luminosity and dynamical mass. Our aim is to de-project the observed ARD onto three-dimensional shapes (oblate, prolate, and triaxial) using Gaussian kernel. We obtain the result that the luminous sample (Mr<-21.2) tends to have more triaxial galaxies than the less luminous sample (Mr>=-21.2) does, while oblate type is more popular in the less luminous one. For a fixed dynamical mass, we also find that the triaxial component in the luminous sample tends to be rounder than that of the less luminous one. A limitation of our approach is that the fraction and preference of each type severely depend on the oblate/prolate/triaxial classification scheme.