

Dependence to physical quantities of dust extinction and galaxy evolution

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Dust extinguishes UV and optical light and re-emits infrared (IR) radiation. Though originally star forming galaxies should be bright in UV because of the radiation from massive stars, star formation of the galaxies is hidden by dust produced their own. So we cannot estimate the true SFR only through UV observations. A complementary IR observation is the most direct to overcome this problem, it is often difficult. Instead, a correlation between ratio of FUV to FIR luminosity and UV color, called IRX-beta relation, is often used in order to estimate amount of extinction especially for distant galaxies whose IR observation is usually difficult. However, in fact this correlation has a large dispersion, so this approach needs to be reconsidered. In this study, we examined dependence on various physical quantities of galaxies of this correlation in local galaxies using data of AKARI, GALEX, 2MASS, SDSS, and IRAS PCSz. The result suggested a trajectory of secular galaxy evolution with a continuous star formation history (SFH) starting from small, bluish, and low-metallicity galaxies and resulting in large, reddish and metal-rich galaxies. Apart from those ones, there are some very energetic galaxies which could not be explained by this continuous SFH. We examined these results using a galaxy spectral evolution model which is consistent with chemical evolution.