The Infrared Excess-UV spectral Slope Relation of Galaxies and its Evolution at 0 < z < 3

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In the studies of galaxy evolution, the genuine galaxy spectrum without attenuation is often needed, and the evolution of the attenuation curve is also fundamental for the investigation for the evolution of dust in galaxies.

In this study, we aim at exploring the attenuation curve in galaxies at redshifts of z ~ 1-3 by the new deep galaxy survey data from MUSYC and GOODS-Herschel projects. This time, we show one of the important aspects of dust attenuation, the infrared-excess-ultraviolet slope (IRX-β) relation as an early result. This relation plays a vital role in evaluating the dust attenuation of distant galaxies whose infrared (IR) emission is generally difficult to measure, since IR observation is not required to estimate the attenuation by this method. However, various studies showed that the IRX-β relation has a large variety depending on the properties of galaxies, e.g., ultraviolet (UV) selected or IR selected, star-forming or quiescent, etc. Especially, when we are interested in the evolution of galaxies, first we must clarify the evolution of the IRX-β relation.

We present the evolution of the global IRX-beta relation. We found that the relation has a very large scatter at all redshifts. We also found that the average relation show little evolution with redshifts. Then we show its dependence on various physical properties, like star formation rate, FUV and FIR luminosities, and stellar mass, etc., with the aid of spectral energy distribution (SED) fitting with a code CIGALE.