Construction of the Spectral Energy Distribution Model of Galaxies and Application to Observational Data

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Abstract

Heavy elements are formed by nucleosynthesis in the process of steller evolution, and significant fractions of them are emitted to interstellar space as dust grains. Dust grains scatter and absorb the ultraviolet and optical emission from massive stars, and re-emit in the infrared. To understand the intrinsic properties of galaxies, we must take into account both of dust extinction and re-emission. In this study, we constructed a spectral energy distribution (SED) model which is consistent with chemical evolution of galaxies by considering dust extinction and re-emission. By fitting our SED model to observational data, we can estimate star formation rate, metallicity, dust abundance and other important quantities of galaxies. Further, we are able to use this model for data obtained from high-z observations because our SED model is consistent with chemical evolution, in other words, physically more realistic.