

R18b Infrared SED Model of Metal Poor Galaxies: Application to SBS 0335–052 and Prospects for a Large Infrared Survey

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Roughly, galaxy formation is the onset of star formation, and hence, the onset of metal production. Short-lived OB stars returns back metal in the form of dust grains, and generally, some amounts of dust can exist in young galaxies. Dust also activates the star formation through interstellar extinction and molecule formation (Hirashita et al. 2002). They have paid especial attention to the nearby, extremely low-metallicity galaxy SBS 0335–052, which may masquerade as a high-redshift forming galaxy, and successfully explained its observed properties such as dust amount and far infrared (FIR) luminosity.

We used the dust radiation model of Takeuchi et al. (this meeting) as well as the model of dust amount by Hirashita et al., and established the model of IR spectral energy distribution (SED). This model well reproduces the MIR–FIR SED of SBS 0335–052 observed by *ISO*. SBS 0335–052 has an unusual IR SED that has a strong flux at MIR in spite of its low metallicity ($1/41 Z_{\odot}$). This is quite consistent with a very young starburst that has the age of several $\times 10^6$ yr and compact size of < 100 pc. The young age and compact size are also consistent with the optical properties of the galaxy. This indicates that both of MIR and FIR surveys are necessary to examine the dust amount of galaxies with wide range of metallicity. About several hundreds of local low metallicity galaxies may be detected in the ASTRO-F all sky survey. Such a sample will be useful for the systematic studies on ‘primeval galaxies’.