

The very young first galaxy SED: Contribution from Pre-Main-Sequence Stars

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It is expected that the first galaxies will be observed by the next generation telescopes, such as NASA's James Webb Space Telescope (JWST). The early star-forming galaxies are expected to brighten in the rest frame near-infrared. Understanding their spectra accurately is important to prepare future observations. In the conventional calculations of spectra of galaxies, Pre-main-sequence (PMS) stars are not considered. In nearby galaxies, this assumption does not matter. However, PMS stars in the first galaxies, which do not contain heavy elements, can be directly observed. For young first galaxies, the contribution from PMS stars can be significant.

We calculate the spectral energy distribution (SED) of the first galaxies, which contain PMS stars, by calculating contribution from PMS stars by combining the stellar evolution code MESA and the spectra model BT-Settl model, and contribution from MS stars by using the stellar population synthesis code PEGASE. We estimate the SEDs for various models with different IMFs, ages, and star formation histories. We find that the contribution from PMS increases the AB magnitude by 1 in mid-infrared, and PMS stars' contribution can be significant over 0.5 Myr after a star-formation episode. Thus, we reveal the importance of PMS in the first galaxy SED.

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Talk/Poster

Talk

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