R25b FLUCTUATION OF THE SUBMM BACKGROUND FROM FORMING GALAXIES

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We constructed a new semi-analytic model of the evolution of dust emission of very young low-mass galaxies based on the hierarchical clustering scenario. By its construction, our model naturally includes the formation of dark halos and the evolution of baryonic structures in a quite simple but consistent way. Using this model, we predict the contribution from forming galaxies to the fluctuation of cosmic background radiation at wavelengths of $200-650\mu$m. Since the small grain sizes in young metal-poor galaxies make the appearance of their infrared spectral energy distribution (SED) quite different from that of nearby older galaxies, we adopt a new model for the evolution of dust content and the infrared SED of low-metallicity, extremely young galaxies. This SED model, together with the dark halo mass function and halo bias model, enables us to investigate theoretically the properties of the number counts of forming galaxies and their contribution to the spectrum and the angular correlation of the background radiation in the IR – millimeter. Though the contribution is small compared with that of giant sub-mm sources at $z = 1$–3, fluctuation signal at shorter wavelengths is unique to these forming population. Hence, comparing our predictions with forthcoming future observations will provides crucial information to constrain the physical processes of galaxies in their formation phase. It is also useful to construct obervational strategies for future facilities, e.g., like ALMA.