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Evolution and Feedback Effects of High-z Star-Forming Galaxies

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Abstract. I review the recent observational progresses of star-forming galaxies at a redshift up to z∼10. Inconjunction with gravitational lensing magnifications, deep HST observations obtain first density estimates of UV continuum radiation given by young massive stars, and reveal that the star-formation rate density (SFRD)continuously decreases from z∼2-3 to z∼10. This SFRD decrease towards high-z should be explained by thecombination of the cosmic structure formation and radiative cooling+feedback effects in a halo. To decouple thecontribution of the cosmic structure formation from the SFRD decrease, the stellar-to-halo mass ratios (SHMR) ofhigh-z galaxies are derived by intensive clustering analyses with HST and Subaru survey data. The SHMR-halo massrelation shows a clear evolution from z∼0 to 6, suggesting that the cooling and feedback effects are different betweenthe present and early epochs of the cosmic history. By deep imaging and spectroscopic observations, feedbacksignatures are found in 10-100 kpc-scale outflow of ionized oxgen gas identified around star-forming galaxies with andwithout an AGN heating. There are similarly-large hydrogen Lyα halos and blobs associated with high-z star-forminggalaxies, but the physical origin of these Lyα halos and blobs is an open question. At z$\gtrsim$6, UV radiation of ionizingphotons produced by star-forming galaxies contribute to the cosmic reionization, while it is thought that the UVradiation prevent formation of next generation stars in dwarf galaxies at the early cosmic epoch, which works as acosmological feedback effect. I discuss this reionizations cosmological feedback effect with the up-to-date resultsfrom the HST and Planck data.