X38a Unique Overdensity and Nature of Extreme Emission Line Galaxies at z∼7

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Extreme emission line galaxies (EELGs) at high redshifts are considered to be a key contributor to the cosmic reionization at $z > 6$ due to their higher ionization efficiencies. It is thus critical to identify and characterize such EELGs in the early Universe, reveal their physical properties and investigate their interplay with surrounding large-scale structure. We have identified 120 Hβ+[OIII] emitters at $z \sim 7$ selected by the flux excess in the medium-band filter F410M in the JWST public fields of Cycle 1 observations. Notably, we find a number of emitters with a considerably high Hβ+[OIII] rest-frame equivalent width of > 3000 Å. Our spectral energy distribution analysis reveals that they have (i) low stellar mass ($\sim 10^{7.5}\,M_\odot$), (ii) blue colors ($\beta_{UV} \sim -2.2$), and (iii) low dust attenuation ($A_V \sim 0.1$). Some emitters show extended and/or offset Hβ+[OIII] emission compared to the UV and stellar component, suggesting that strong feedback from massive stars and/or AGNs may be playing a role. Moreover, we find 13 objects with emission line distributions offset from the stellar and UV components, which may have been affected by shock heating. Lastly, we report an overdensity of EELGs in one of the observed fields. This may support the idea that dynamical events, such as gravitational instability and merger, trigger intense star formation seen in the EELGs.