

Abstract Submitted
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correlation between star formation activity and electron density in local galaxies TIANXING JIANG, Arizona State Univ — The electron density is tied to the ionization parameter and also provides information on interstellar medium (ISM) conditions on much smaller scales than those used in the studies of the Kennicutt-Schmidt law. We measure the electron density of the ionized gas using the Sulfur line ratio and the star formation intensity in local star-forming galaxies which are composed of four different samples. The measured electron densities span 2 magnitudes, from $\tilde{10} \text{ cm}^{-3}$ to $\tilde{1000} \text{ cm}^{-3}$. The correlation between star formation intensity and electron density in local galaxies is uncovered. Moreover, we find that the correlation in local star-forming galaxies is consistent with that at $z = 2.5$. This means that the high-redshift and local galaxies with the same star formation intensity have very similar electron density, which is contrary to the conclusion in some previous studies, and thus possibly indicates a consistent star formation law in ionized gas in both low- z and high- z galaxies.

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