

An ALMA Census of [OIII]88 μ m and [CII]158 μ m Emission Lines from ~60 Galaxies at $z \sim 6-14$ ○播金 優一¹ (1.東京大学)

We present ALMA [OIII]88 μ m and [CII]158 μ m observations of star-forming galaxies at $z \sim 6-14$. Combining our 18 targets newly observed in our program, Systematic Exploration in the Reionization Epoch using Nebular And Dust Emission (SERENADE; ID: #2022.1.00522.S, PI: Y. Harikane), with 44 galaxies compiled from the literature, we statistically investigate the relations between the far-infrared line luminosities and the star formation rate (SFR) for a total of 62 objects. We find that both the [OIII]–SFR and [CII]–SFR relations show positive correlations, while the line luminosities saturate at the high-SFR end. In addition, the L[OIII]/L[CII] ratio exhibits an anti-correlation with SFR. In this talk, we will discuss the physical origin of these relations to understand the ISM properties of high-redshift galaxies.