

## CO OBSERVATIONS OF HIGH- $z$ OBJECTS

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### 1. BR1202-0725 at $z=4.7$

We have made a CO( $J=2-1$ ) observations using the Nobeyama 45m telescope aimed at examining the physical properties of the molecular gas in this object. The upper limit obtained is 1.8 mK ( $3\sigma$ ) at a velocity resolution of  $100 \text{ km s}^{-1}$ , which leads to an upper limit on the molecular gas mass of  $5.3 \times 10^{11} M_{\odot}$ , if we assume a line width of  $250 \text{ km s}^{-1}$  obtained in the CO( $J = 5 - 4$ ) line (rest-frame) and the Galactic CO-to-H<sub>2</sub> conversion factor of  $4.5 (M_{\odot} \text{ K km s}^{-1} \text{ pc}^2)$ . The line ratio between the 2-1 line and the 5-4 line as well as those from the 7-6 and the 4-3 lines (Omont et al. 1996, *Nature*, **382**, 428) imply that the mean gas density is as high as  $10^{3-5} \text{ cm}^{-3}$ , which is comparable to that in nearby star burst galaxies (e.g., Solomon et al. 1992, *ApJ*, **387**, L55).

### 2. Forming galaxy candidate cB58 at $z=2.7$

We have observed this object in the CO( $J=3-2$ ) line aimed at detecting a large amount of molecular gas, which is expected from the high star formation rate in this object. We have obtained an upper limit of 7.5 mK ( $3\sigma$ ) at a velocity resolution of  $25 \text{ km s}^{-1}$ . The upper limit on the CO luminosity is  $4.4 \times 10^{10} \text{ K km s}^{-1} \text{ pc}^2$  if we assume a velocity width of  $300 \text{ km s}^{-1}$ . A lower limit on the ratio of the H $\alpha$  line luminosity to the CO luminosity is at the upper part of, but within the range of ratios for nearby galaxies. Results are presented in Nakanishi et al. (1997, *PASJ*, **49**, 535).