

**Answer on Question 55070, Physics / Astronomy | Astrophysics**

The most commonly observed CO emission lines arise either from  $J = 1-0$  or  $J = 2-1$  transition, with rest frequencies of about 115 and about 230 GHz. For the upper limit on the redshift:

$$z = \frac{230 - 18}{18} \approx 11.7$$

For the lower limit on the redshift:

$$z = \frac{115 - 40}{40} \approx 1.9$$

**Answer:  $z = 11.7$  and  $z = 1.9$**