

# GLT OPERATIONS LOG

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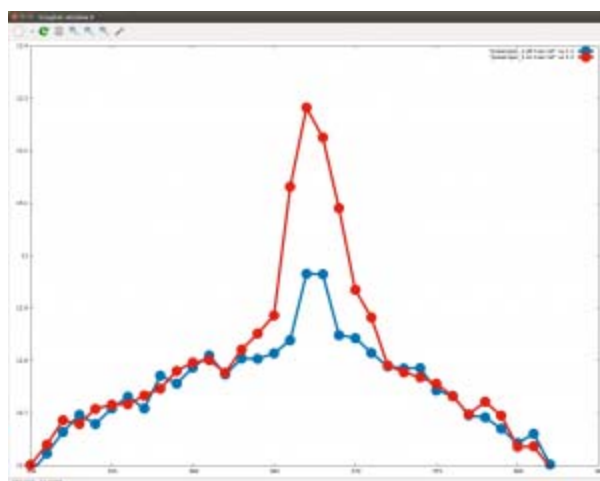
**JANUARY 12, 2018 BY KEIICHI ASADA**

## Detection of CO 2-1 (230.538 GHz) towards Orion KL

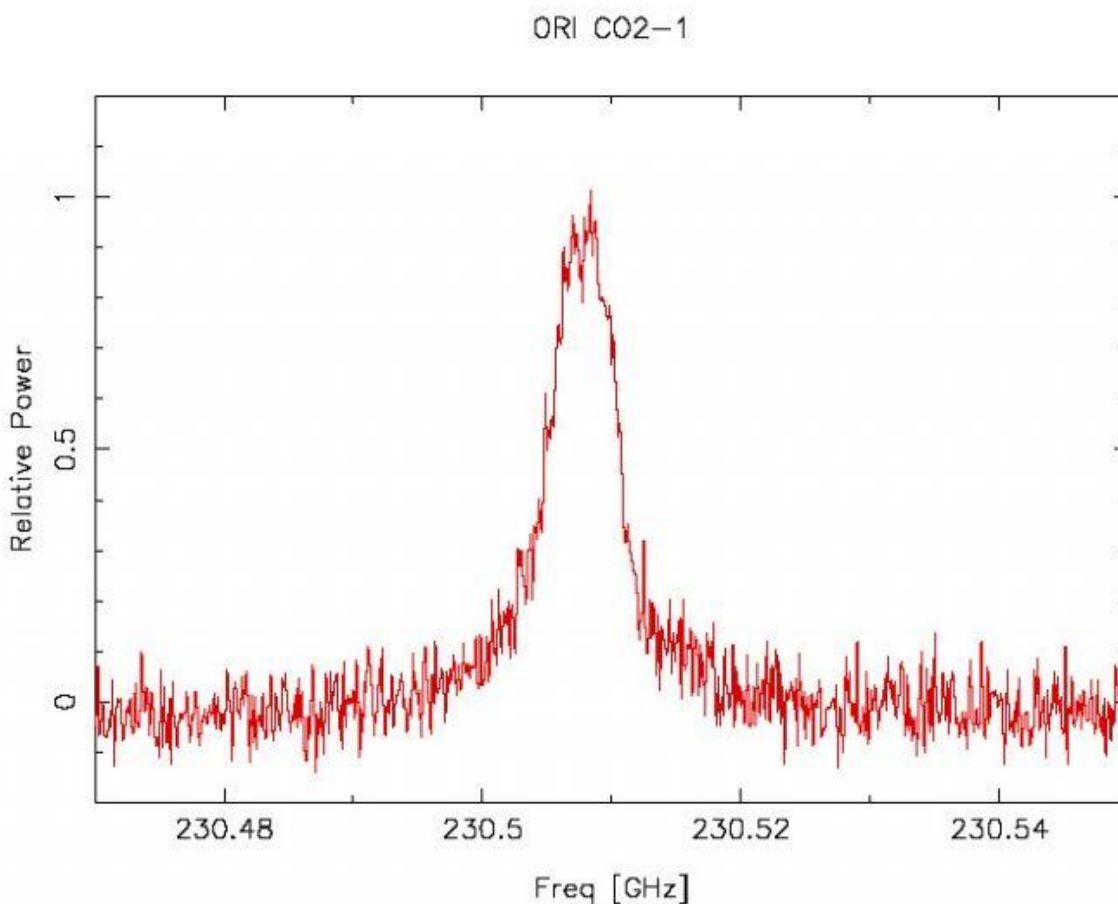
Here, we report our first detection of CO 2-1 towards Orion KL with GLT

After Satoki and Kevin derived the focus position at 230 and 86 GHz for the far field, we started to observe SiO masers towards Chi-Cyg, R-Leo and Orion KL at 86.2 GHz and CO 2-1 line towards Orion KL at 230.538 GHz. Since we confirmed the pointing accuracy only with the moon, Kevin and Satoki pointed the telescope towards 9 positions around the most possible position and 1 off position to search lines, and confirmed it by taking the optical snapshot. We differ by one beam size for the offset at 86 GHz, and 120 arcsec for 230 GHz observation as Orion will be very much extended. We use the R2DBE and Mark6 as the spectrometer, and recorded 40 sec of data for each point.

Once we recorded the data to mark6, Shoko and I transfer the data to GLTCU and derived the power spectrum with the software Lupin developed. With only 1 sec integration towards on- and off- positions for Orion KL at 230 GHz, we clearly start to see the difference around the 368 MHz (which corresponds to  $230.508 = 0.368 + 226.29 + 3.85$  GHz) in the baseband (see attached figure).



Since we did not correct Doppler factor due to the earth motions and difference is order of tens MHz, we expect this difference could be disappear once we will adopt Doppler correction. The signal become much clear when we subtract off-position data from the on-position data (see attached figure).

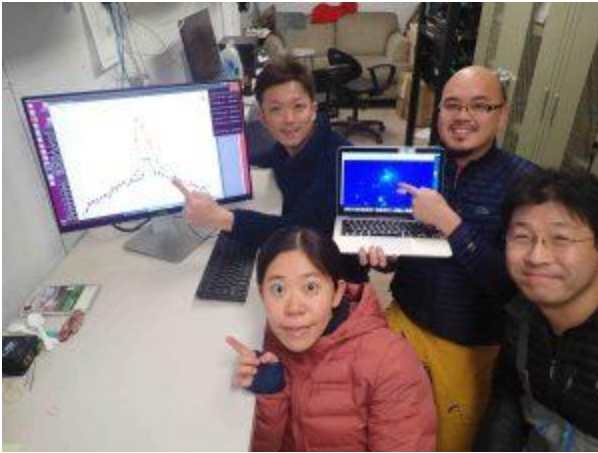


[ORI230CO2-1.180111.2](#) (original pdf)

We confirmed the line shapes change towards by position to position, while other part of the spectrum remains the same. This variation should be due to the change of the source at different positions. Therefore, we conclude that the observed line should be astronomical line associated with CO 2-1 of Orion KL.

This is the first detection of the spectral line towards astronomical source. More evaluation work will follow.

Thanks and congratulations to everyone work on the GLT. We are very close to start astronomical observations !!



OLYMPUS DIGITAL CAMERA

Keiichi, Shoko, Satoki, Kevin, Tim and Pierre (Team at Thule now)

## OBSERVATIONS

One Reply to “Detection of CO 2-1 (230.538 GHz) towards Orion KL”



**Makota Inoue**

**JANUARY 12, 2018 AT 9:42 AM**

Congratulations!

Very beautiful profile of CO. Our GLT is now coming on line, coming from great efforts of all of you.

What is going on a press release?