

Proposal Identification	08_0038			
Project Title	HyGAL: characterizing the Galactic interstellar medium with hydrides			
Principle Investigator	D. Neufeld	neufeld@jhu.edu		
SMO contact person	R. Klein	rklein@sofia.usra.edu		
GREAT processing liaison	H. Wiesemeyer (MPIfR)	hwiese@mpifr.de		
<b>Observations</b>				
Mission Identification	2021-07-24_GR_CAMERON_760, 2021-07-27_GR_CAMILLE_762, 2021-08-08_GR_CHELSEA_767, 2021-08-12_GR_CLARENCE_770, 2021-08-14_GR_CLEOPATRA_772			
Flight date	2021-07-24, 2021-07-27, 2021-08-08, 2021-08-12 2021, 2021-08-14			
GREAT configuration	front-ends: 4GREAT/LFA, HFA		back-ends: XFFTS spectrometers	
Astronomical Sources	G10P47+0P03 G29P96-0P02	Scan	39686 - 39706 38340 - 38341 38629 - 38638	lines: CII_U, OI_63_L ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L CH_149_U CII_U OI_63_L
	G29P9_M15		39870 - 39882 39883 - 39890 39870 - 39890 38639 - 38945	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
	G32P80+0P19		38646 - 38662	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
			39236 - 39244 39245 - 39257 39236 - 39257	CH_149_U, CII_L OI_63_L

	G32P80_M15	38675 - 38680	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
	G32P80_P15	38663 - 38674	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
	G45P07+0P13	38361 - 38397	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
	I16060-5146	39624 - 39634 39635 - 39643 39624 - 39643 38400 - 38433	CH_149_U CII_U OI_63_L ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
	I16164-5046	39280 - 39302 38681 - 38692	CII_U, OI_63_L ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
	I16164_M15	38707 - 38716	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L

	I16164_P15	38693-38706	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
	NGC6334_I	38434-38452 38726-38729	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L
	NGC6334I_M15	39303 - 39313 39314 - 39325 39303 - 39325 38717 - 38725	CH_149_U, CII_U OI_63_L
	NGC6334I_P15	38730 - 38733	ArH+(1-0)_U, OH+(12-01)_U, SH_U, OH_2PI32_HU, OI_63_L

Calibrated data products based on: kosma\_calibrator ver. git-157-g01cefdd, GILDAS software ver. sep21a

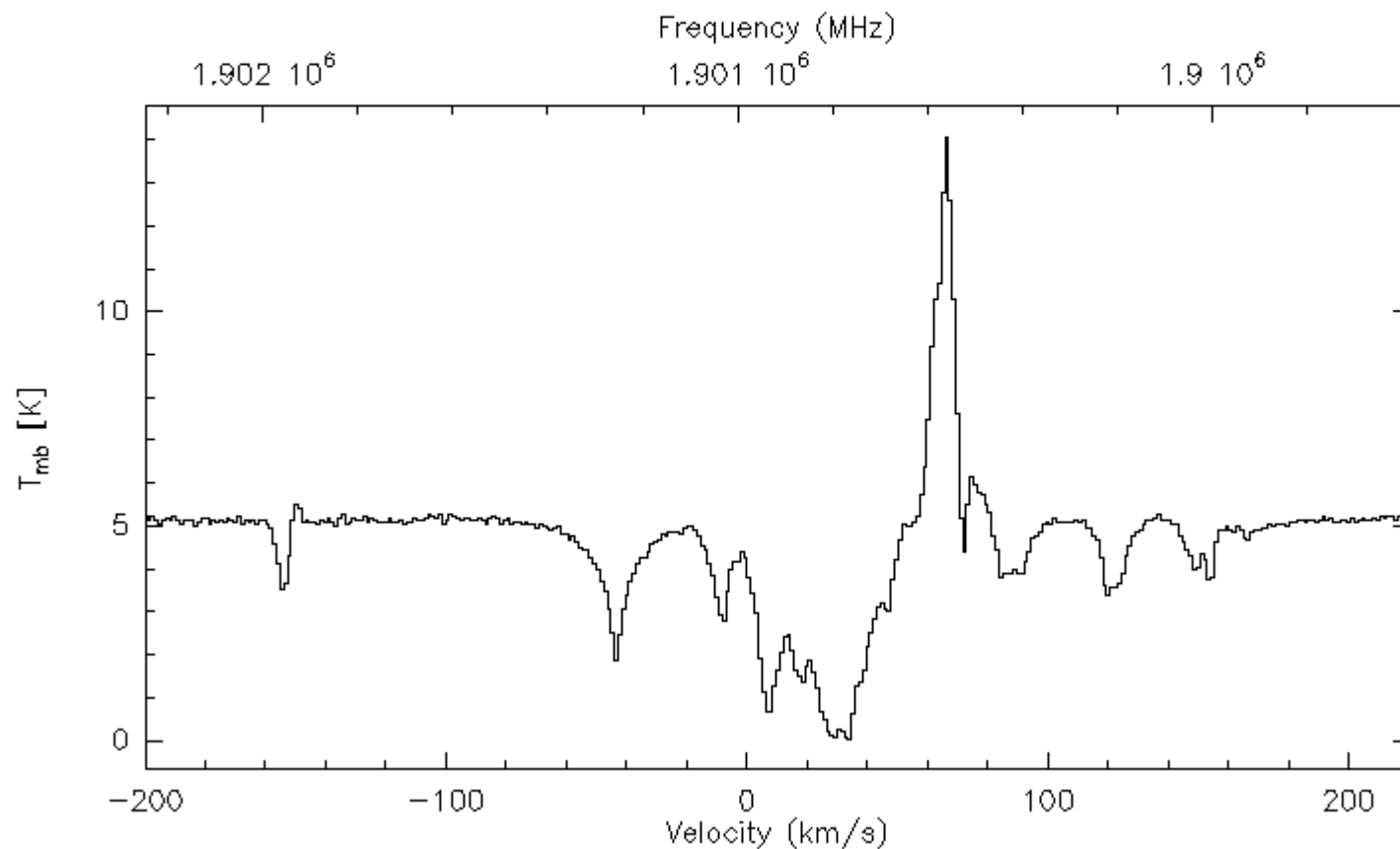
product level	file name	description
3	Cycle9_GR_OT_08_0038_DNeufeld_Tant.great Cycle9_GR_OT_08_0038_DNeufeld_Tmb.great	Calibrated to $T_A^*$ scale ( $\eta_f = 0.97$ ). Calibrated to $T_{mb}$ scale with: $\eta_{mb}$ (LFAH) = (0.66, 0.64, 0.67, 0.69, 0.65, 0.65, 0.68); $\eta_{mb}$ (LFAV) = (0.63, 0.64, 0.66, 0.63, 0.64, 0.64, 0.65); $\eta_{mb}$ (HFA) = (0.65, 0.66, 0.69, 0.69, 0.70, 0.65, 0.70); $\eta_{mb}$ (4G <sub>j</sub> , j=1 to 4) = 0.51, 0.59, 0.71, 0.57. The main beam temperature data file has been created with the script Cycle9_GR_OT_08_0038_DNeufeld.class (set INIT to yes upon execution of procedure). All scans have been quality validated.

4	<p>Cycle9_GR_OT_08_0038_DNeufeld_G10P47_CII.great  Cycle9_GR_OT_08_0038_DNeufeld_G10P47_OI.great  Cycle9_GR_OT_08_0038_DNeufeld_G29P9_ArHp.great  Cycle9_GR_OT_08_0038_DNeufeld_G29P9_CH.great  Cycle9_GR_OT_08_0038_DNeufeld_G29P9_CII.great  Cycle9_GR_OT_08_0038_DNeufeld_G29P9_OH.great  Cycle9_GR_OT_08_0038_DNeufeld_G29P9_OHp.great  Cycle9_GR_OT_08_0038_DNeufeld_G29P9_OI.great  Cycle9_GR_OT_08_0038_DNeufeld_G29P9_SH.great  Cycle9_GR_OT_08_0038_DNeufeld_G32P80_ArHp.great  Cycle9_GR_OT_08_0038_DNeufeld_G32P80_CH.great  Cycle9_GR_OT_08_0038_DNeufeld_G32P80_CII.great  Cycle9_GR_OT_08_0038_DNeufeld_G32P80_OH.great  Cycle9_GR_OT_08_0038_DNeufeld_G32P80_OHp.great  Cycle9_GR_OT_08_0038_DNeufeld_G32P80_OI.great  Cycle9_GR_OT_08_0038_DNeufeld_G32P80_SH.great  Cycle9_GR_OT_08_0038_DNeufeld_G45P07_CH.great  Cycle9_GR_OT_08_0038_DNeufeld_G45P07_CII.great  Cycle9_GR_OT_08_0038_DNeufeld_G45P07_OI.great  Cycle9_GR_OT_08_0038_DNeufeld_I16060_CII.great  Cycle9_GR_OT_08_0038_DNeufeld_I16060_OI.great  Cycle9_GR_OT_08_0038_DNeufeld_I16164_ArHp.great  Cycle9_GR_OT_08_0038_DNeufeld_I16164_OH.great  Cycle9_GR_OT_08_0038_DNeufeld_I16164_OHp.great  Cycle9_GR_OT_08_0038_DNeufeld_I16164_OI.great  Cycle9_GR_OT_08_0038_DNeufeld_I16164_SH.great  Cycle9_GR_OT_08_0038_DNeufeld_NGC6334_ArHp.great  Cycle9_GR_OT_08_0038_DNeufeld_NGC6334_CH.great  Cycle9_GR_OT_08_0038_DNeufeld_NGC6334_CII.great  Cycle9_GR_OT_08_0038_DNeufeld_NGC6334_OH.great  Cycle9_GR_OT_08_0038_DNeufeld_NGC6334_OHp.great  Cycle9_GR_OT_08_0038_DNeufeld_NGC6334_OI.great  Cycle9_GR_OT_08_0038_DNeufeld_NGC6334_SH.great</p>	<p>Created with:  Cycle9_GR_OT_08_0038_DNeufeld.class</p> <p>Polynomial or wavelet fits of 1st to 4th order removed. Added back continuum level (determined from dedicated DSB calibration, which can be retrieved by means of the CAL_SIG, CAL_IMG spectra). Averaged equivalent spectra with <math>1/\sigma_{\text{rms}}^2</math> weighting where <math>\sigma_{\text{rms}}</math> is the noise (standard deviation) w.r.t. the baseline, and smoothed to 1.2 km s<sup>-1</sup> channel spacing (with box profile). These data processing steps are summarized in internal procedure myplot.class.</p> <p>Array footprints of CH <math>\lambda 149\mu\text{m}</math>, CII and OI <math>\lambda 63\mu\text{m}</math> in *_footprint.great without continuum underneath.</p>
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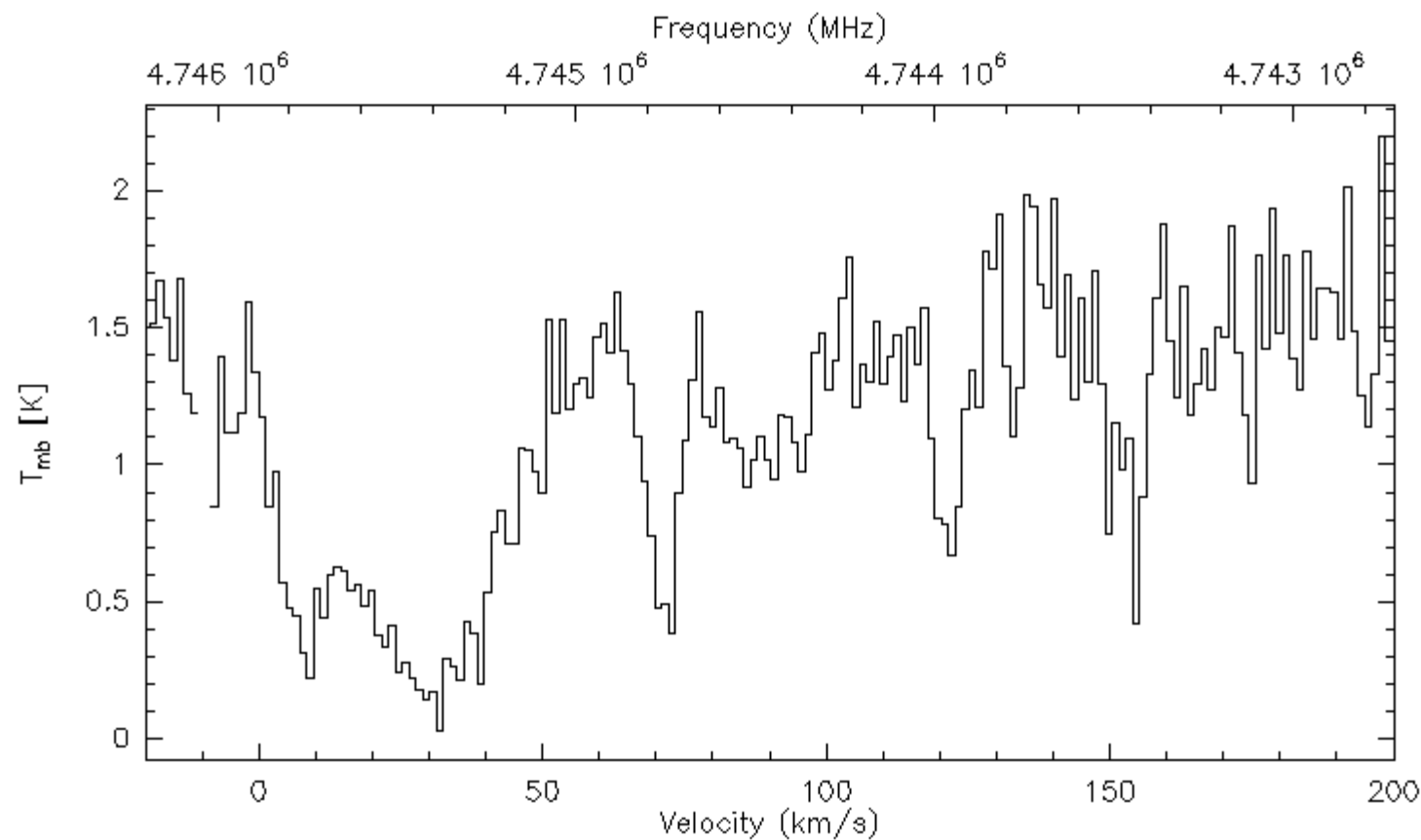
- Notes: (1) Heyminck, S. et al.: GREAT: the SOFIA high-frequency heterodyne instrument. *Astron.Astrophys.* 542, L1 (2012)  
(2) Guan, X. et al.: GREAT/SOFIA atmospheric calibration. *Astron.Astrophys.* 542, L4 (2012)  
(3) Risacher, C. et al.: First Supra-THz Heterodyne Array Receivers for Astronomy with the SOFIA Observatory. *IEEE Trans.TST* 6,199 (2016)  
(4) Risacher, C. et al.: The upGREAT 1.9 THz multi-pixel high resolution spectrometer for the SOFIA Observatory, *Astron.Astrophys.* 595, 34 (2016)  
(5) Durán et al., *IEEE Transactions on Terahertz Science and Technology*, vol. 11, issue 2, pp. 194-204

Results for individual targets & tunings (4G1 to 4, CH and CII in LFA, OI 63 $\mu$ m in HFA). For details, see data reduction letter.

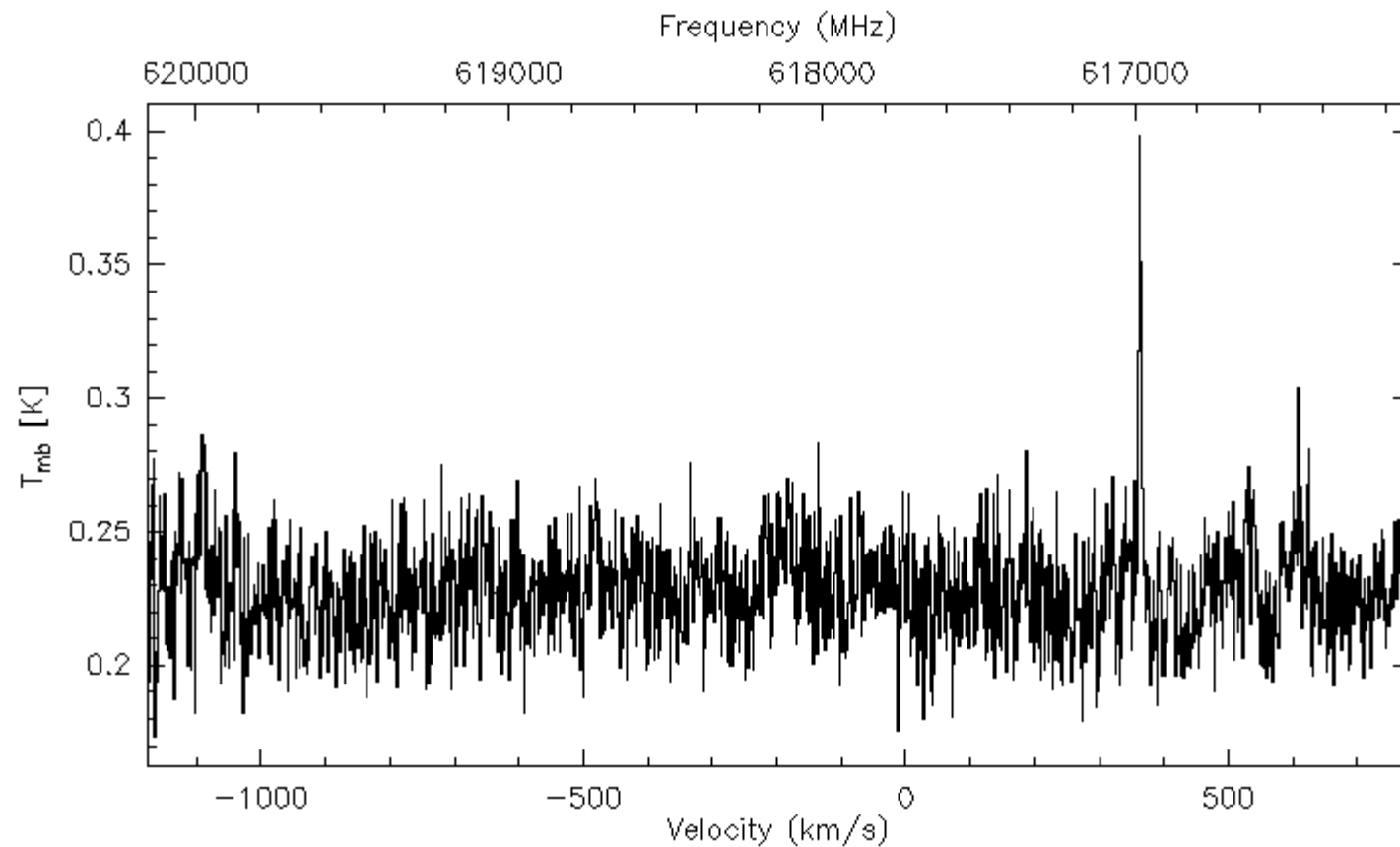
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RA: 18:08:38.40 DEC: -19:51:52.0 Eq 2000.0 Rad. 0.0° Offs: +1.4 +0.2  
Good tau: 0.246 Tsys: 3425. Time: 43.1min El: 37.4  
N: 528 l0: 159.007 V0: 70.00 Dv: -1.194 LSR  
FO: 1900536.90 Df: 7.568 Fi: 1898136.27



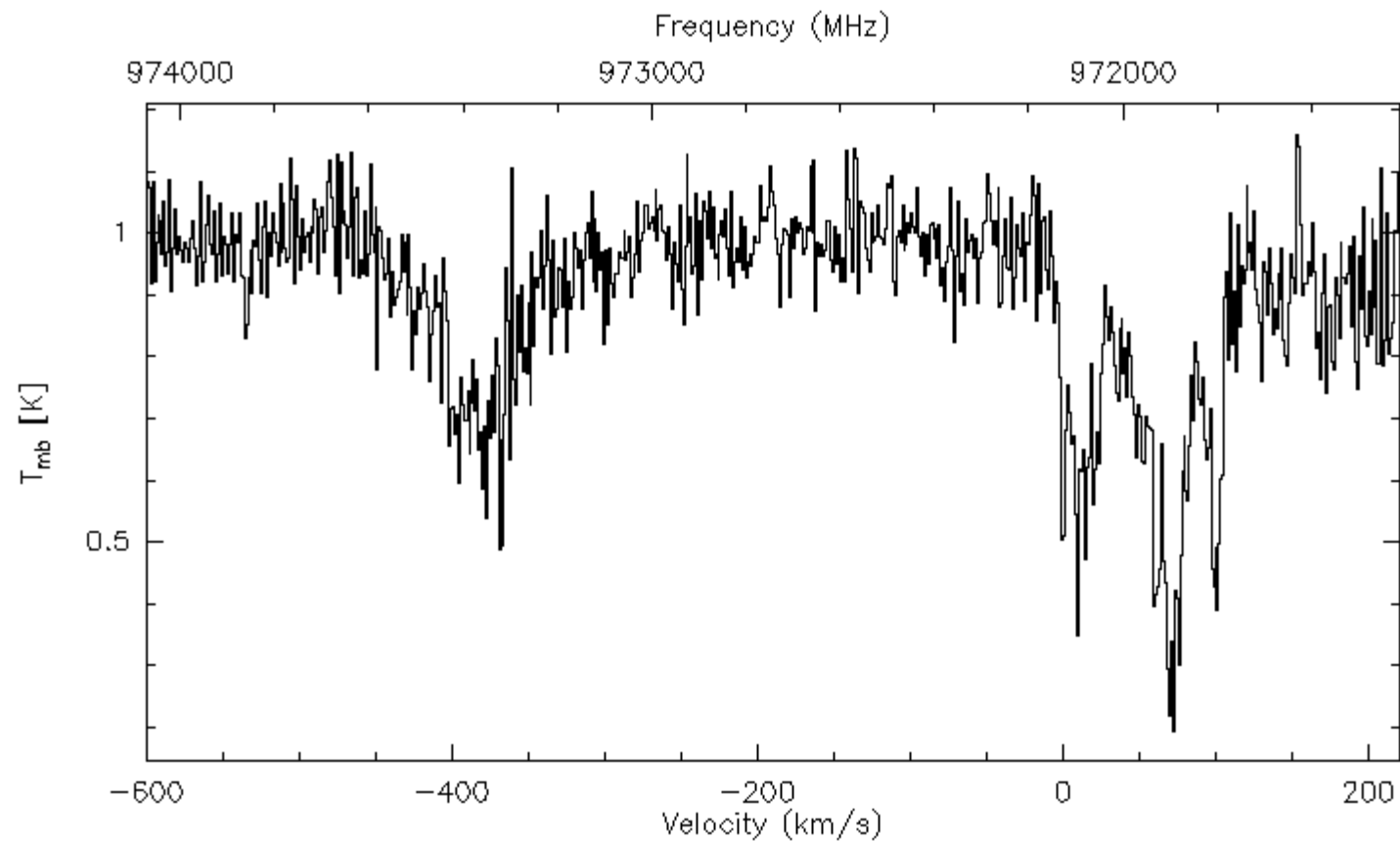
O;0 G10P47+0P03 OI 63 L SOF-HFAV 0 S O:12-AUG-2021 R:27-OCT-2021  
RA: 18:08:38.40 DEC: -19:51:52.0 Eq 2000.0 Rad. 0.0° Offs: -0.7 -1.5  
Fair tau: 0.479 Tsys: 5724. Time: 15.6min El: 38.0  
N: 242 I0: 105.703 V0: 70.00 Dv: 1.204 LSR  
F0: 4744777.49 Df: -19.05 Fi: 4747576.88



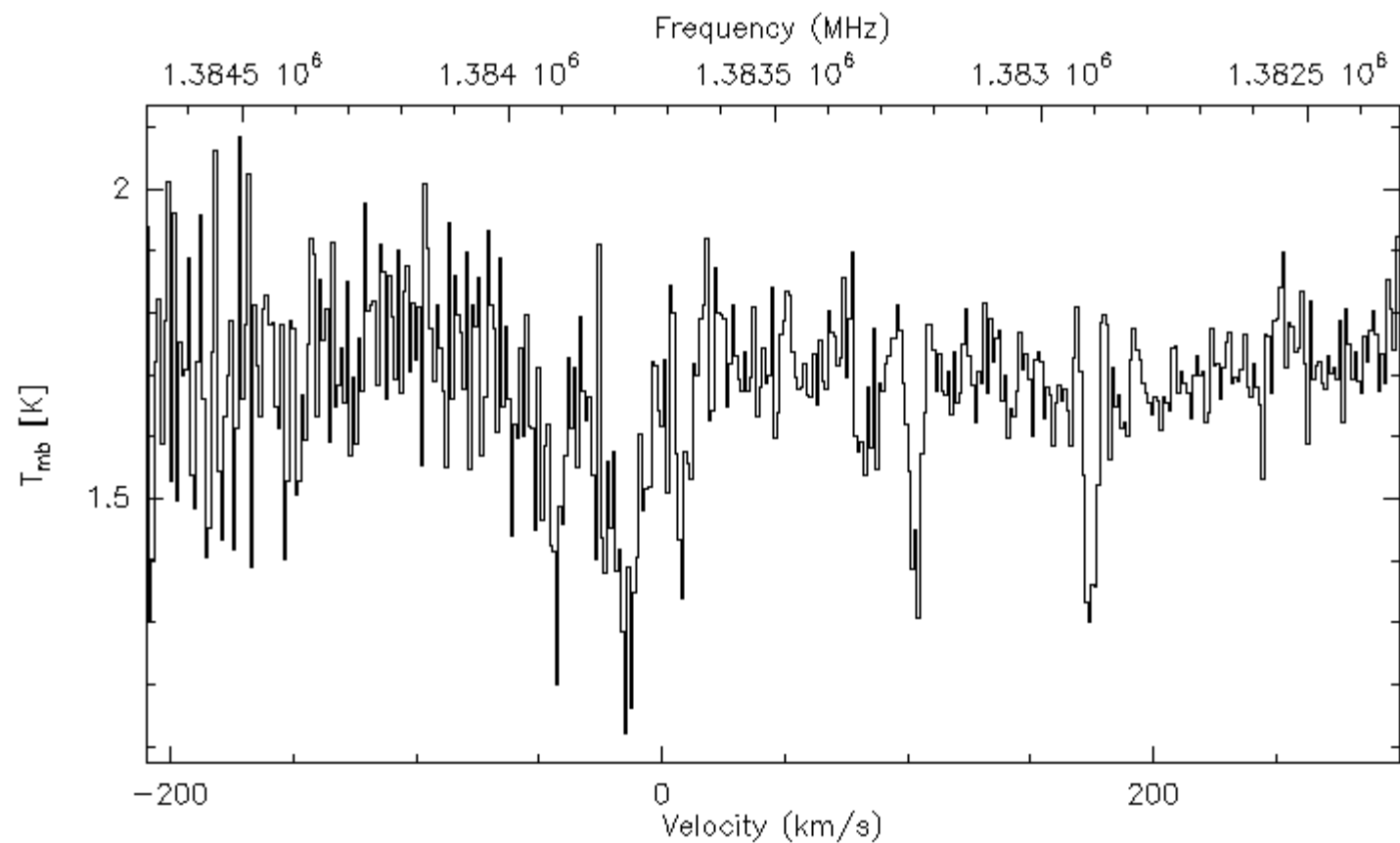
O;0 G29P96-0P02 ArH+(1-0) U SOF-4G1 0 S 0:27-JUL-2021 R:27-OCT-2021  
RA: 18:46:03.72 DEC: -02:39:21.2 Eq 2000.0 Rad. 0.0° Offs: -0.1 +3.7  
Excellent tau: 0.047 Tsys: 521. Time: 27.5min El: 35.5  
N: 1651 l0: 1077.91 V0: 100.0 Dv: 1.186 LSR  
F0: 617525.226 Df: -2.442 Fi: 606721.911



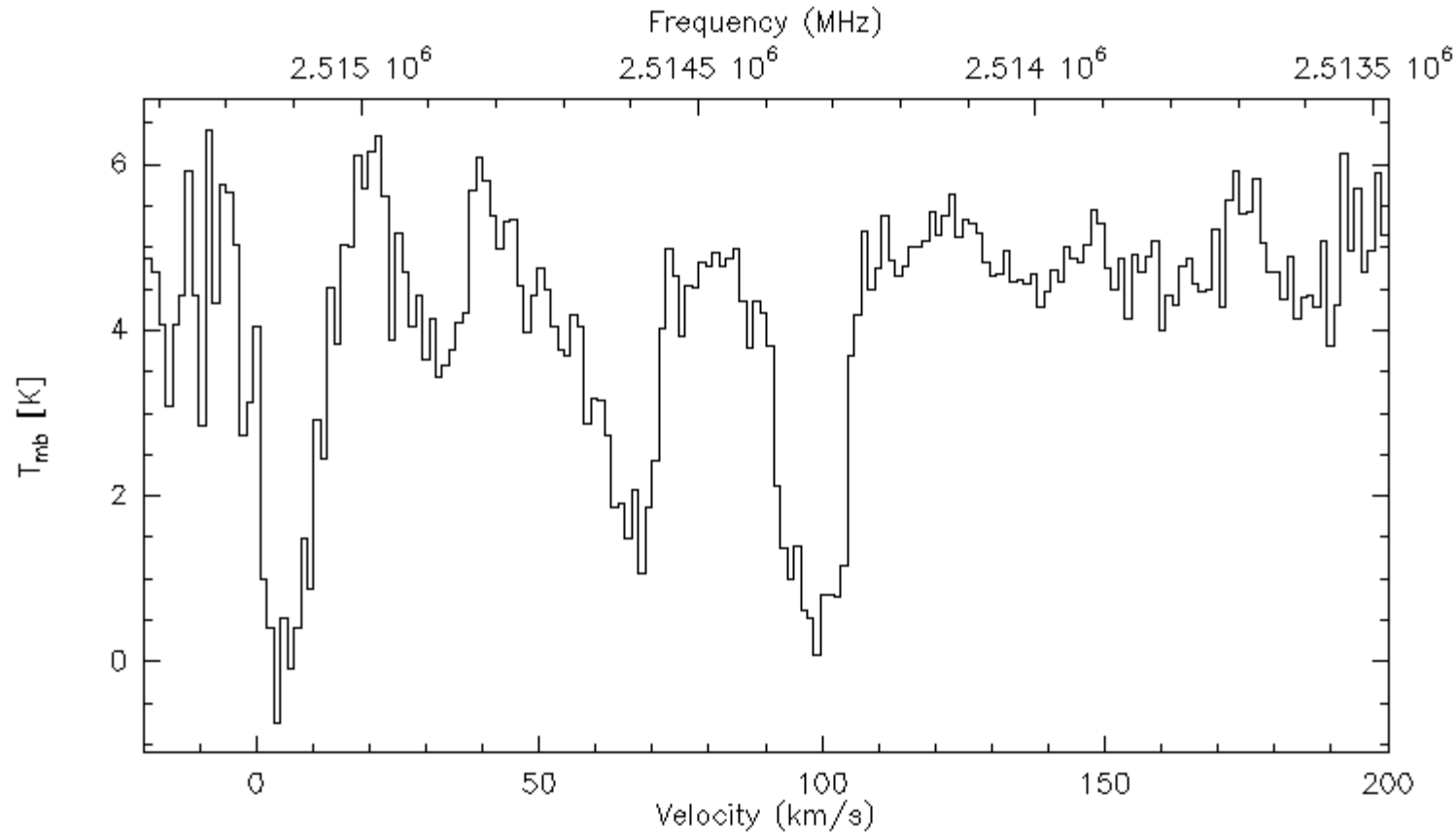
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RA: 18:46:03.72 DEC: -02:39:21.2 Eq 2000.0 Rad. 0.0° Offs: +0.2 +2.0  
Fair tau: 0.455 Tsys: 2101. Time: 27.5min El: 35.5  
N: 1036 l0: 588.821 V0: 100.0 Dv: 1.205 LSR  
F0: 971803.800 Df: -3.907 Ff: 960300.270



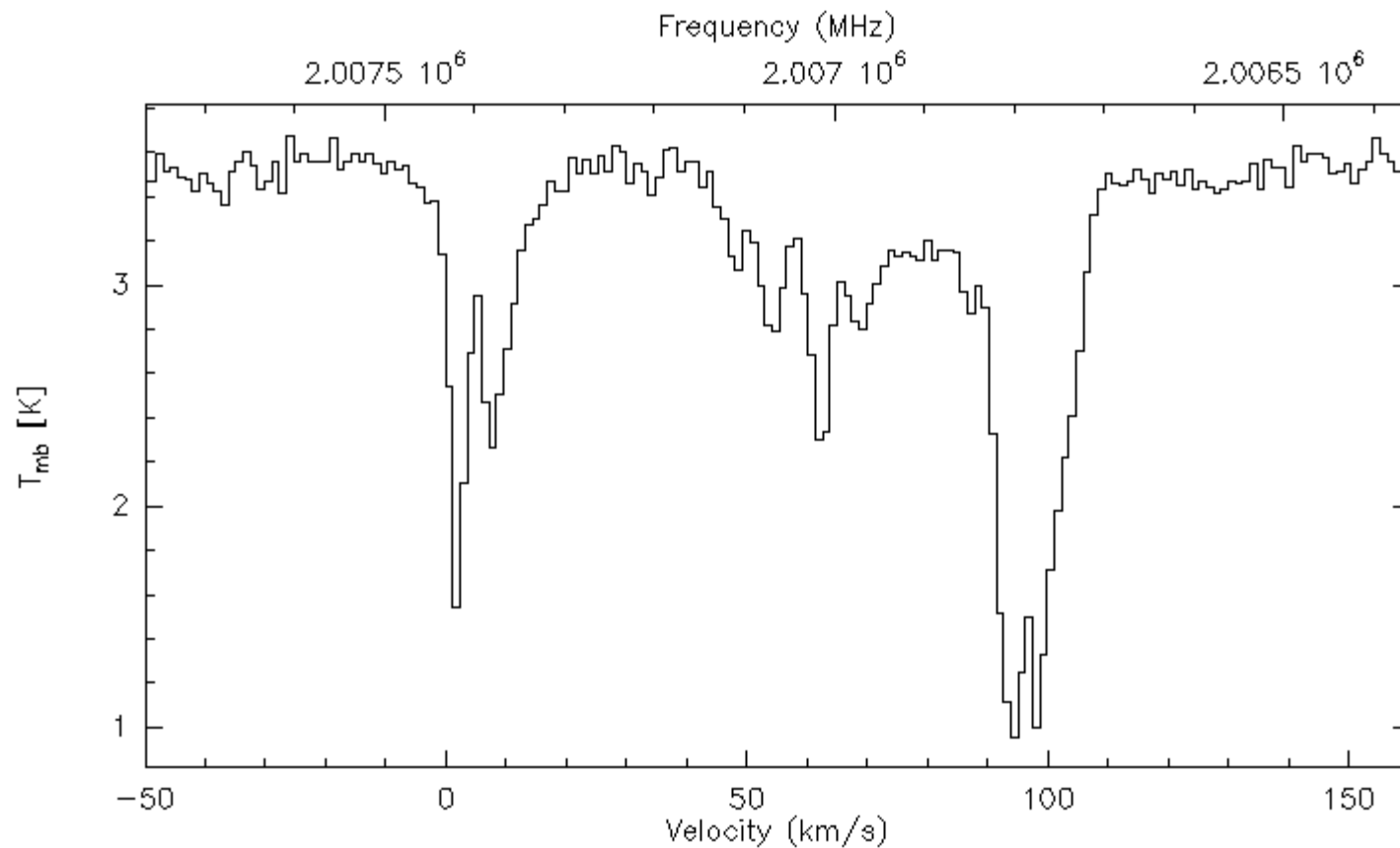
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RA: 18:46:03.72 DEC: -02:39:21.2 Eq 2000.0 Rad. 0.0° Offs: +0.6 +1.2  
Good    tau: 0.189    Tsys: 4371.    Time: 27.5min    El: 35.5  
N: 724    I0: 249.757      V0: 100.0      Dv: -1.217      LSR  
FO: 1383250.00      Df: 5.617      Fi: 1380449.14



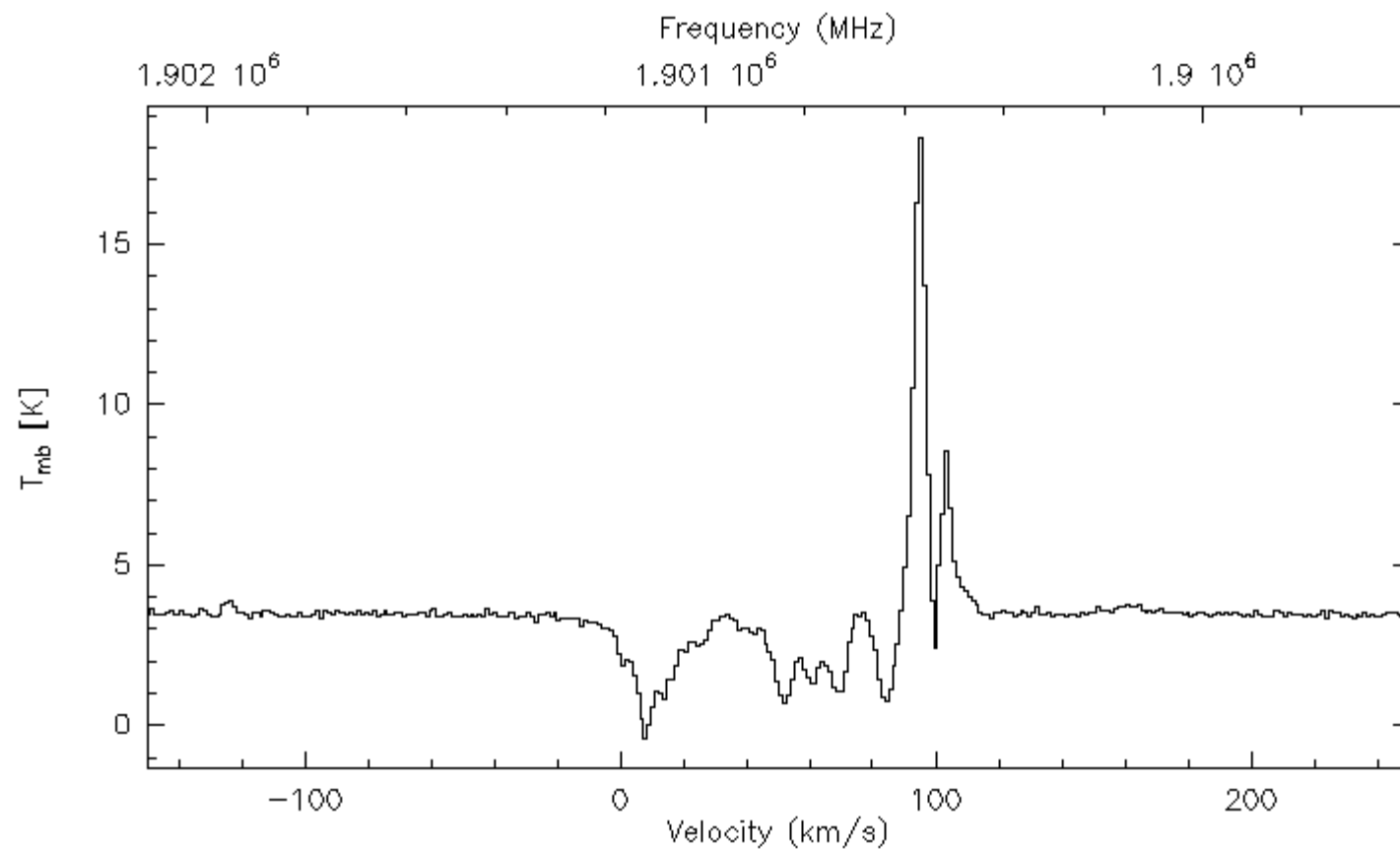
0;0 G29P96-0P02 OH 2PI32 HU S0F-4G4 0 S 0:27-JUL-2021 R:27-OCT-2021  
RA: 18:46:03.72 DEC: -02:39:21.2 Eq 2000.0 Rad. 0.0° Offs: +0.0 +0.0  
Good tau: 0.187 Tsys: 22700. Time: 27.5min El: 35.5  
N: 412 I0: 150.317 V0: 100.0 Dv: -1.194 LSR  
F0: 2514316.71 Df: 10.01 Fi: 2511315.79



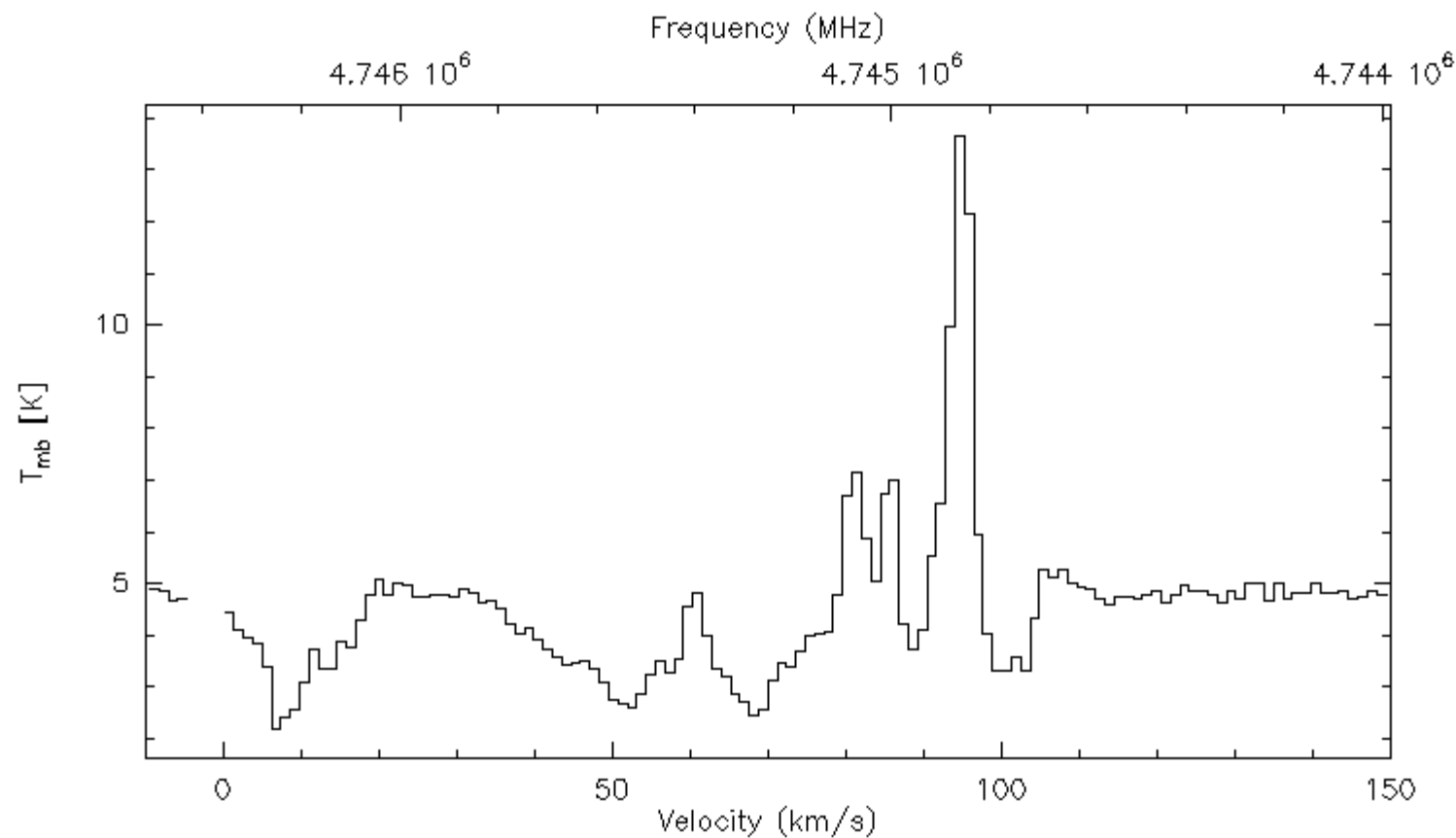
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RA: 18:46:03.72 DEC: -02:39:21.2 Eq 2000.0 Rad. 0.0° Offs: +1.4 +0.2  
Good tau: 0.217 Tsys: 3260. Time: 23.9min El: 47.4  
N: 496 l0: 149.400 V0: 100.0 Dv: -1.204 LSR  
F0: 2006762.58 Df: 8.057 Fi: 2004361.77



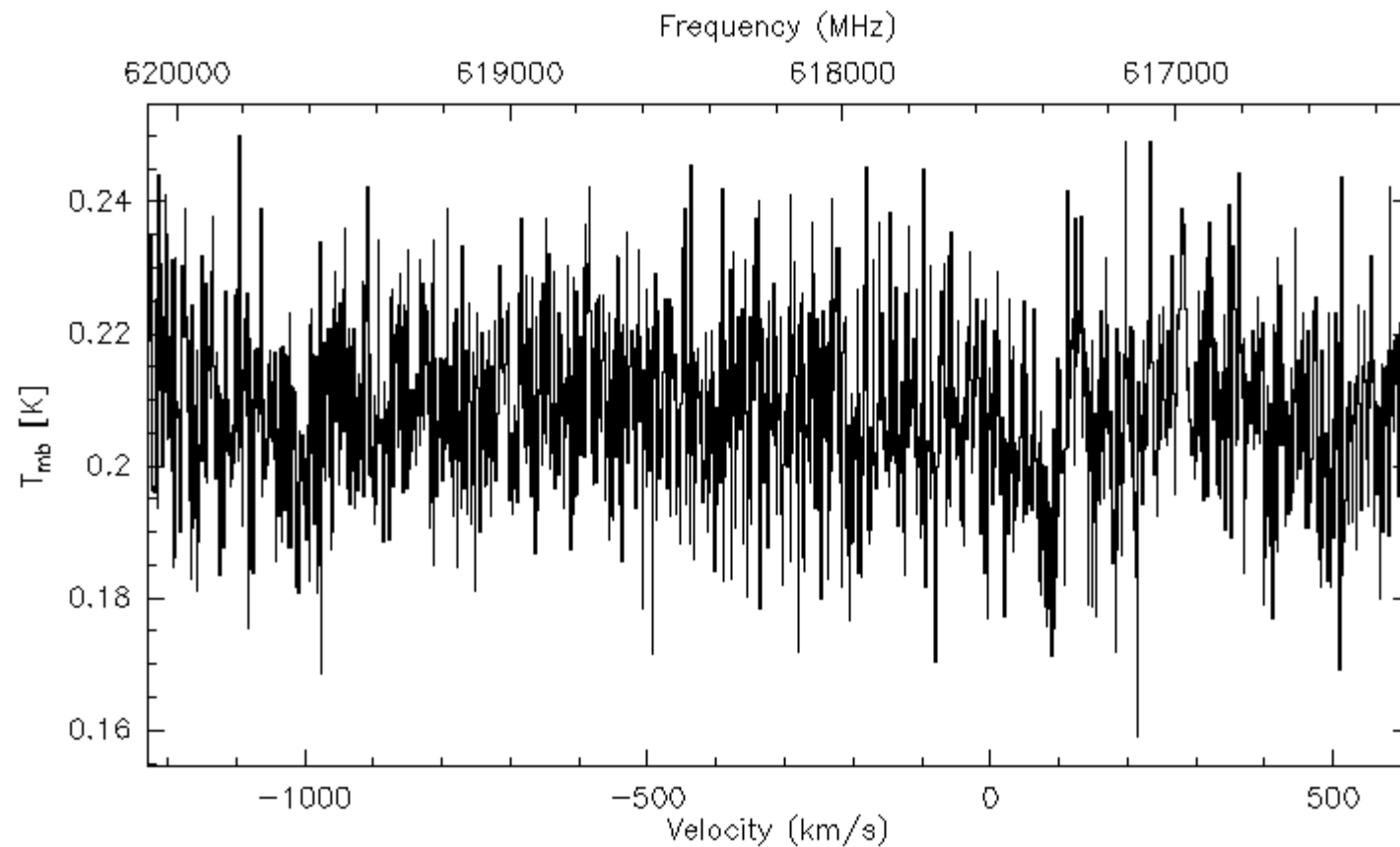
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RA: 18:46:03.72 DEC: -02:39:21.2 Eq 2000.0 Rad. 0.0° Offs: +1.4 +0.2  
Good tau: 0.291 Tsys: 3382. Time: 18.4min El: 52.4  
N: 528 l0: 159.007 V0: 100.0 Dv: -1.194 LSR  
F0: 1900536.90 Df: 7.568 Fi: 1898136.09



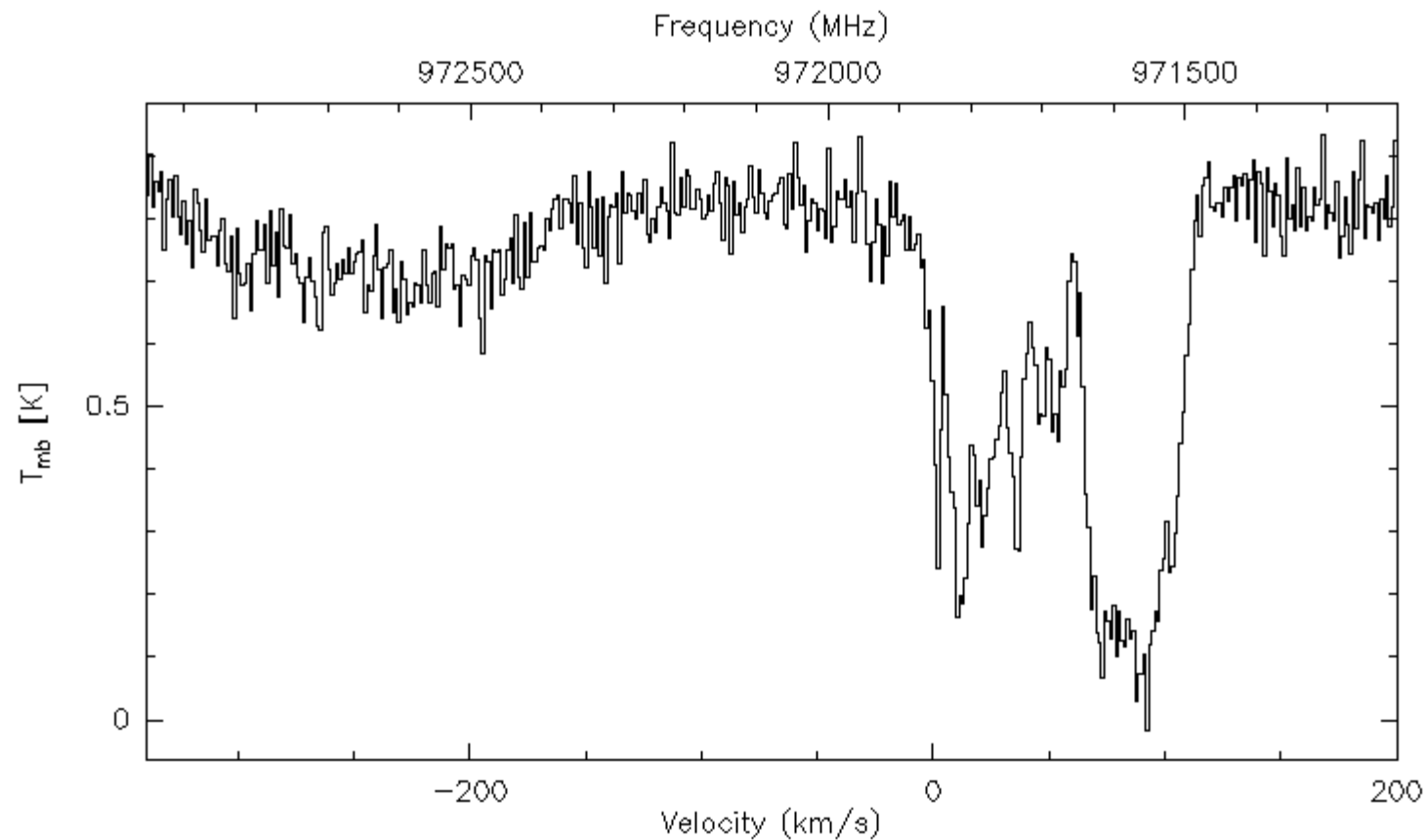
0;0 G29P96-0P02 OI 63 L SOF-HFAV 0 S 0:14-AUG-2021 R:27-OCT-2021  
RA: 18:46:03.72 DEC: -02:39:21.2 Eq 2000.0 Rad. 0.0° Offs: +0.1 -0.5  
Poor tau: 1.136 Tsys: 5526. Time: 37.2min El: 43.5  
N: 241 I0: 105.370 V0: 100.0 Dv: 1.204 LSR  
F0: 4744777.49 Df: -19.05 F1: 4747578.98



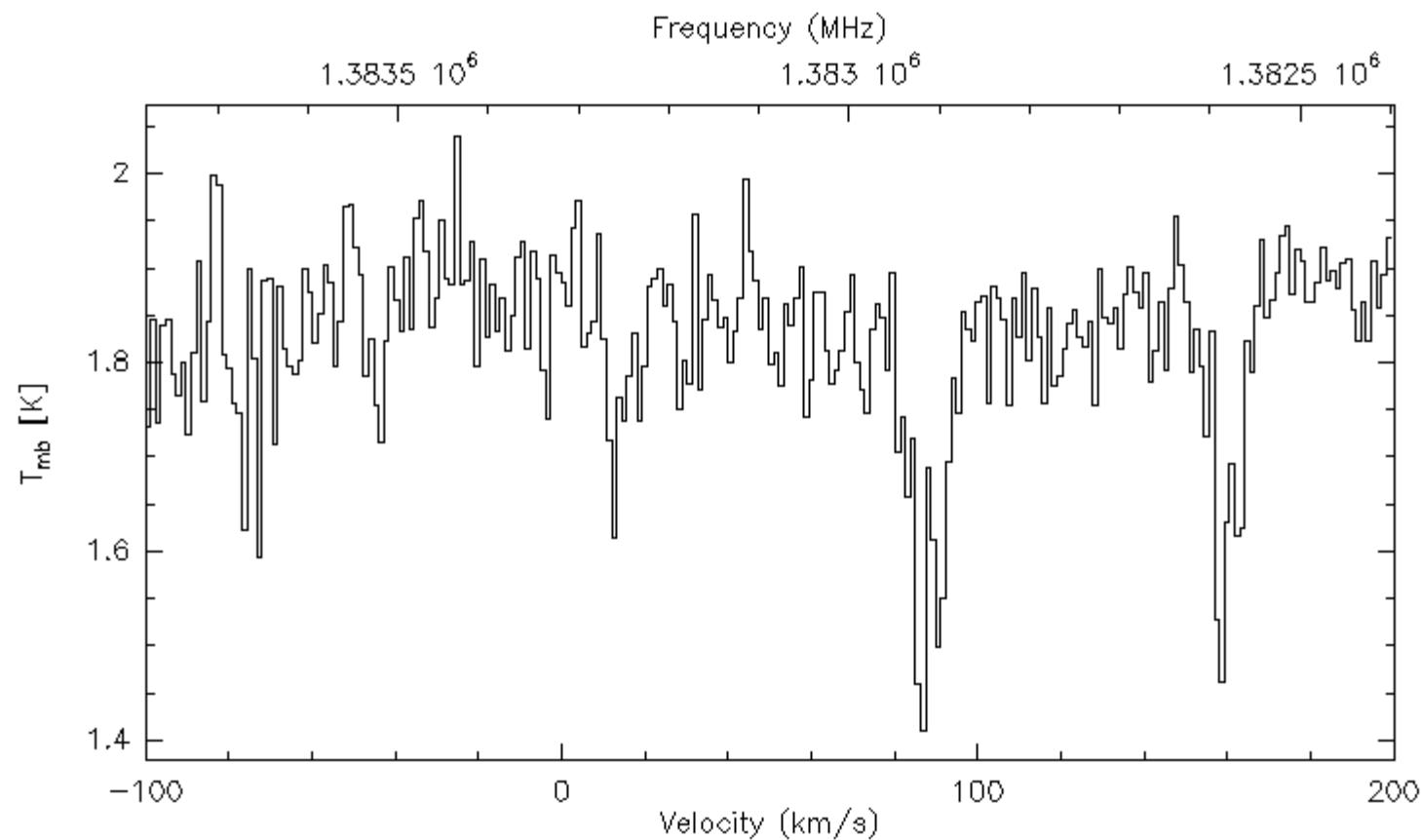
O;0 G32P80+0P19 ArH+(1-0) U SOF-4G1 O S O:27-JUL-2021 R:27-OCT-2021  
RA: 18:50:30.62 DEC: -00:02:00.0 Eq 2000.0 Rad. 0.0° Offs: -0.1 +3.7  
Excellent tau: 0.013 Tsys: 507. Time: 35.8min El: 50.4  
N: 1663 l0: 1077.86 V0: 15.00 Dv: 1.185 LSR  
F0: 617525.226 Df: -2.442 Fi: 606724.965



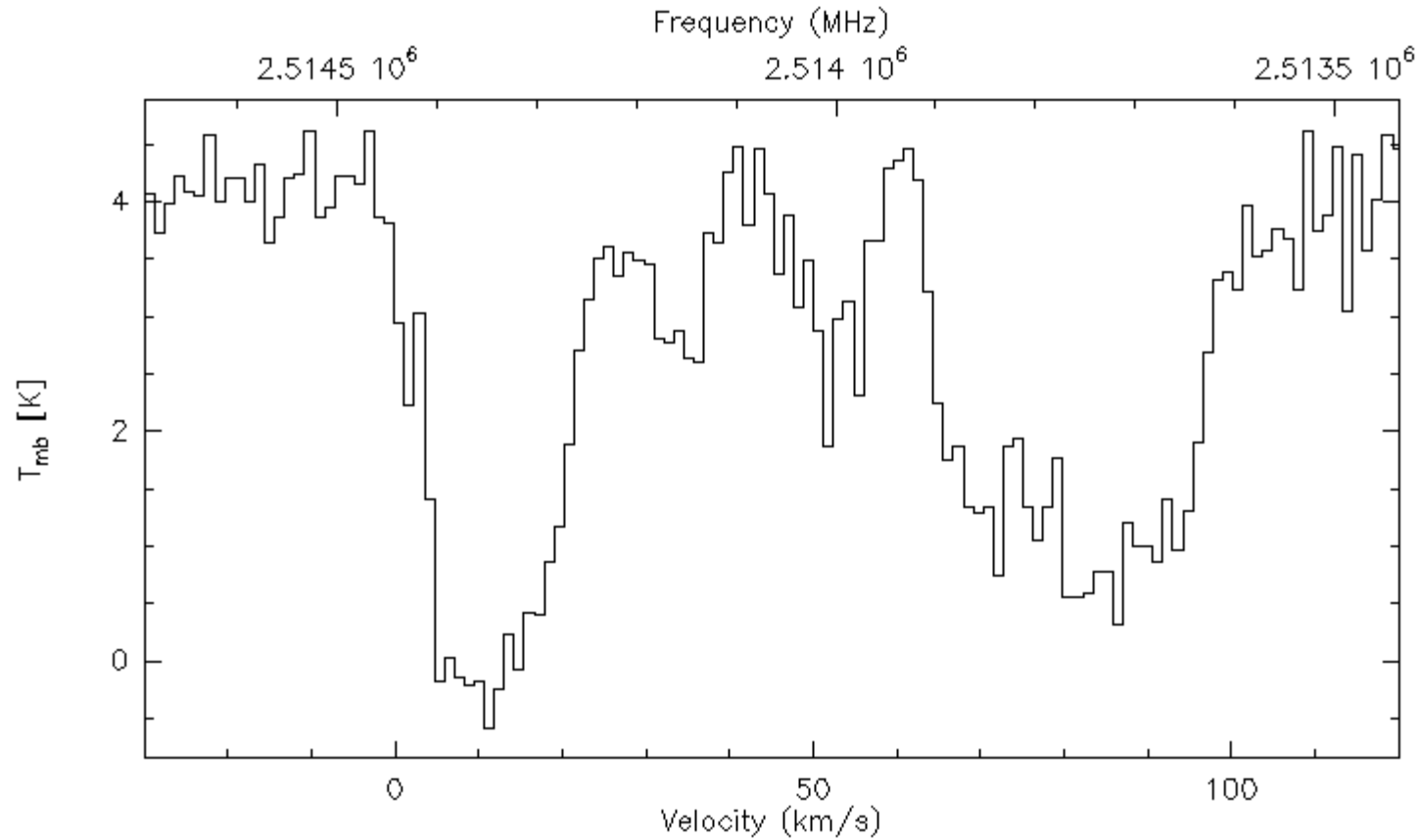
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RA: 18:50:30.62 DEC: -00:02:00.0 Eq 2000.0 Rad. 0.0° Offs: +0.2 +2.0  
Excellent tau: 0.058 Tsys: 2013. Time: 35.8min El: 50.4  
N: 1048 I0: 588.795 V0: 15.00 Dv: 1.205 LSR  
F0: 971803.800 Df: -3.907 F1: 960303.522



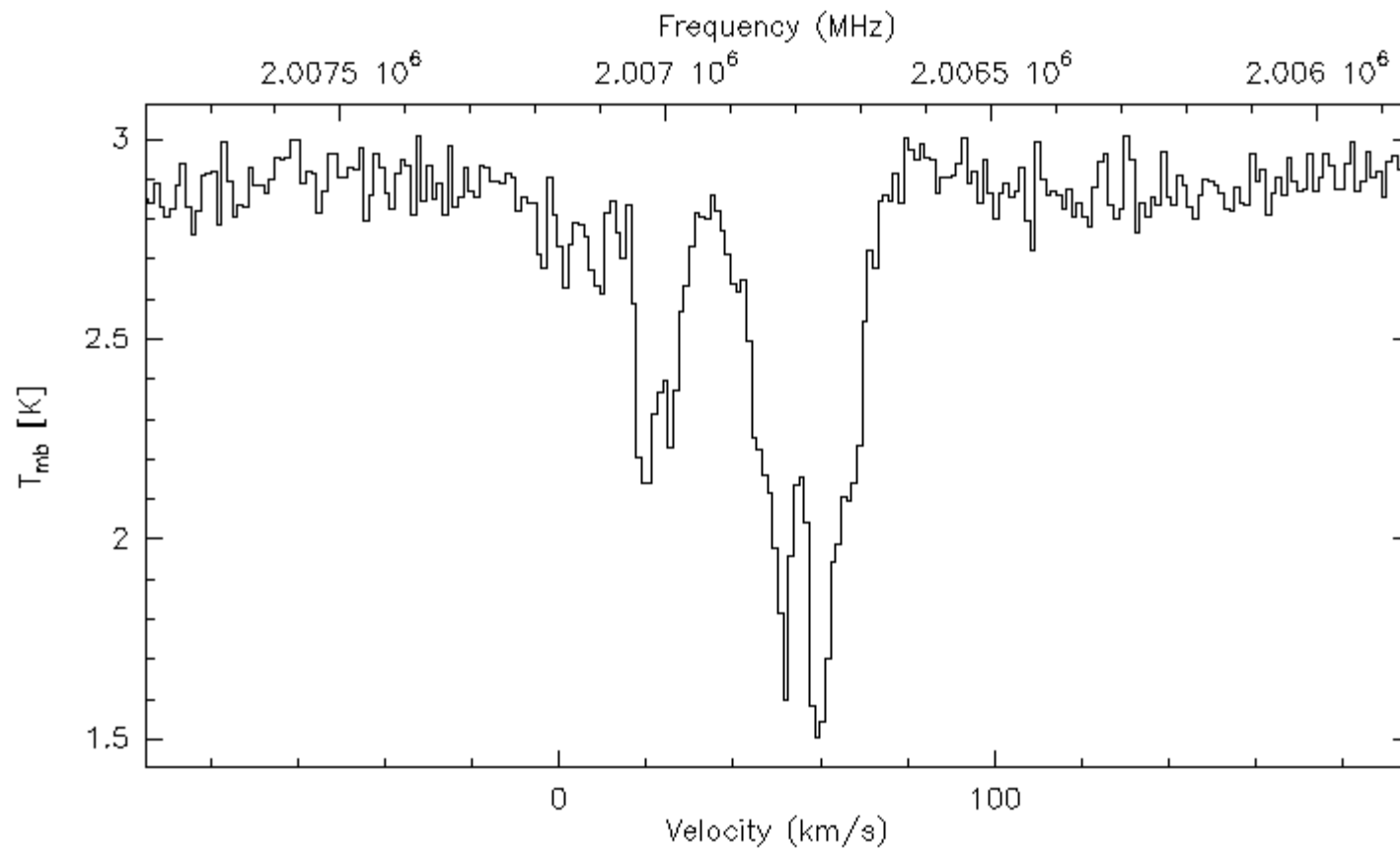
0;0 G32P80+0P19 SH U      SOF-4G3 O S    O:27-JUL-2021 R:27-OCT-2021  
RA: 18:50:30.62 DEC: -00:02:00.0 Eq 2000.0 Rad. 0.0° Offs: +0.6 +1.2  
Excellent tau: 0.051 Tsys: 4427. Time: 35.8min El: 50.4  
N: 736 l0: 262.081      V0: 15.00      Dv: -1.217      LSR  
FO: 1383250.00      Df: 5.616      Fi: 1380449.93



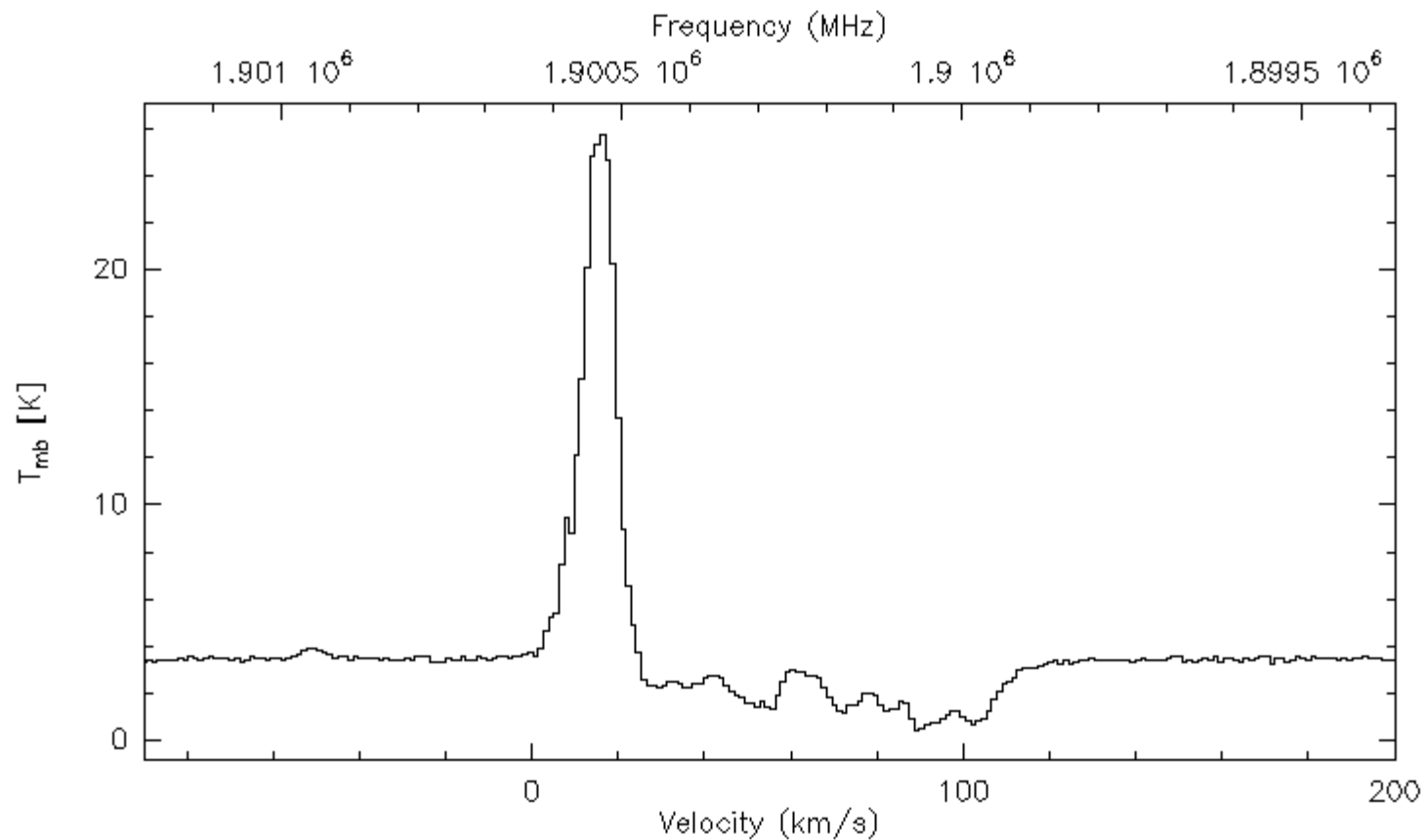
0;0 G32P80+0P19 OH 2PI32 HU SOF-4G4 0 S 0:27-JUL-2021 R:27-OCT-2021  
RA: 18:50:30.62 DEC: -00:02:00.0 Eq 2000.0 Rad. 0.0° Offs: -0.0 -0.0  
Excellent tau: 0.078 Tsys: 22238. Time: 35.8min El: 50.4  
N: 424 l0: 162.884 v0: 15.00 Dv: -1.194 LSR  
FO: 2514316.71 Df: 10.01 Fi: 2511316.63



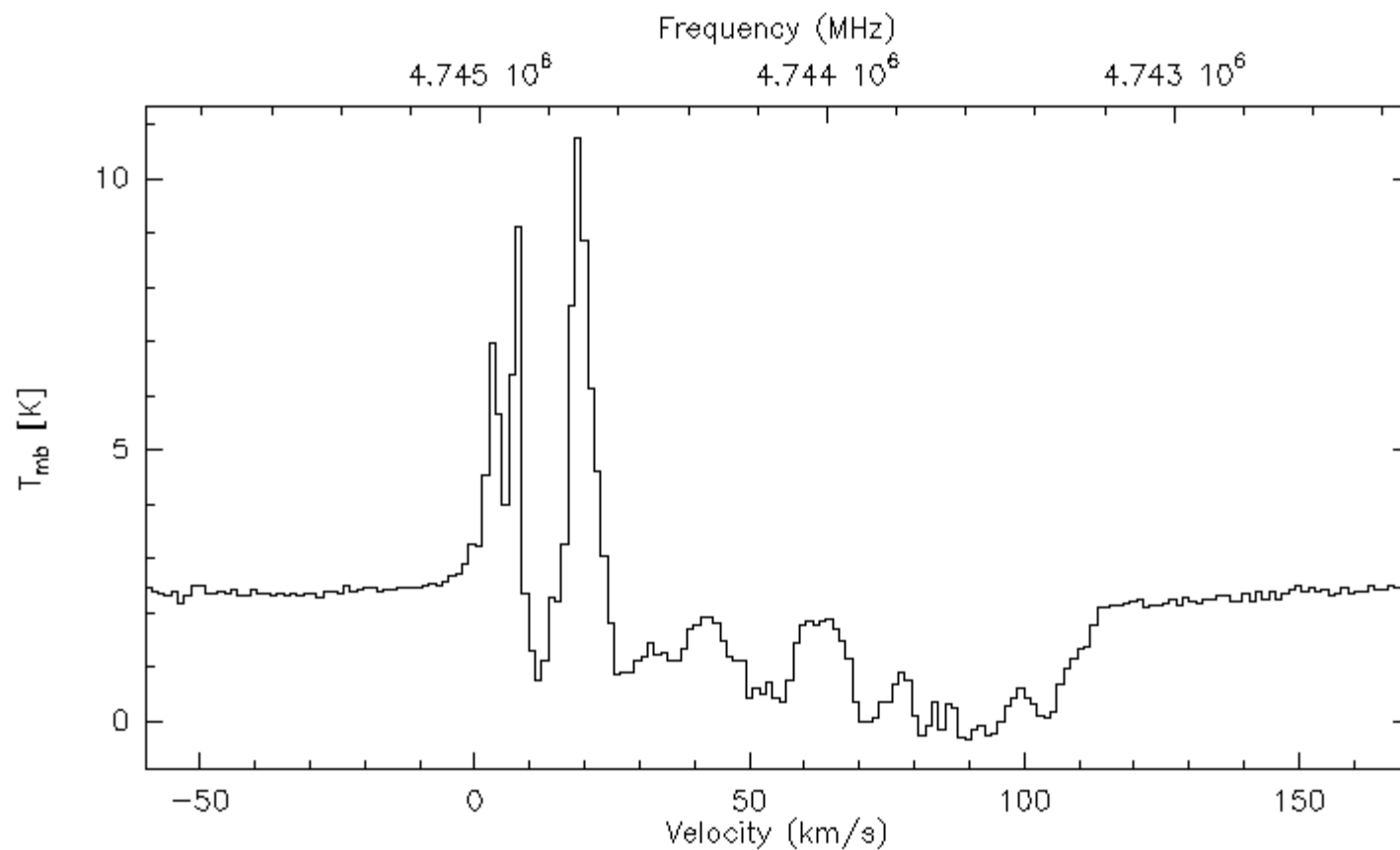
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RA: 19:13:22.00 DEC: 10:50:54.0 Eq 2000.0 Rad. 0.0<sup>a</sup> Offs: +1.4 +0.2  
Good tau: 0.153 Tsys: 3140. Time: 23.0min El: 39.2  
N: 496 l0: 149.400 V0: 60.00 Dv: -1.204 LSR  
F0: 2006762.58 Df: 8.057 Fi: 2004362.15



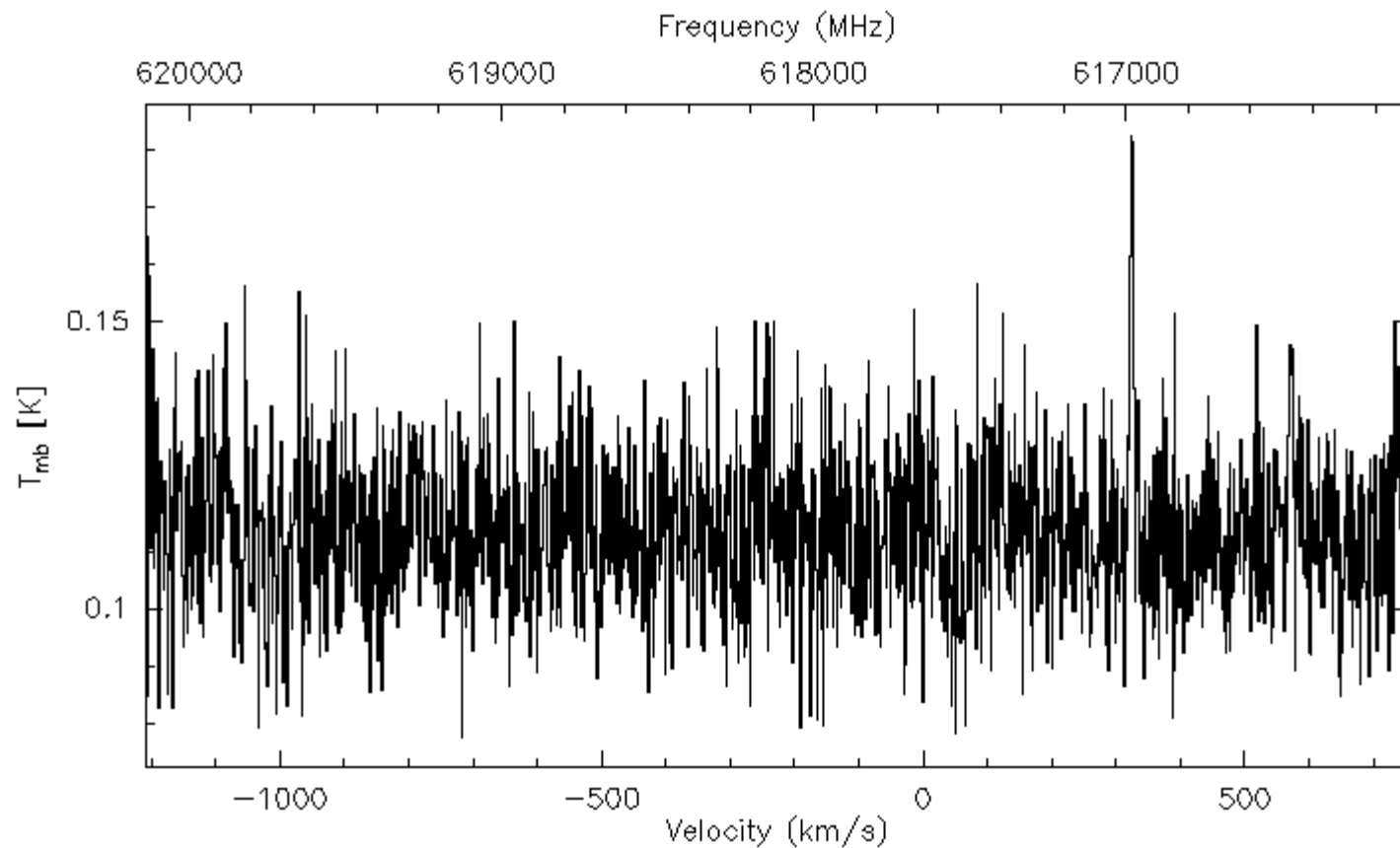
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Good tau: 0.205 Tsys: 3498. Time: 24.8min El: 52.1  
N: 528 l0: 178.826 V0: 15.00 Dv: 1.194 LSR  
F0: 1900536.90 Df: -7.568 Ff: 1903237.01



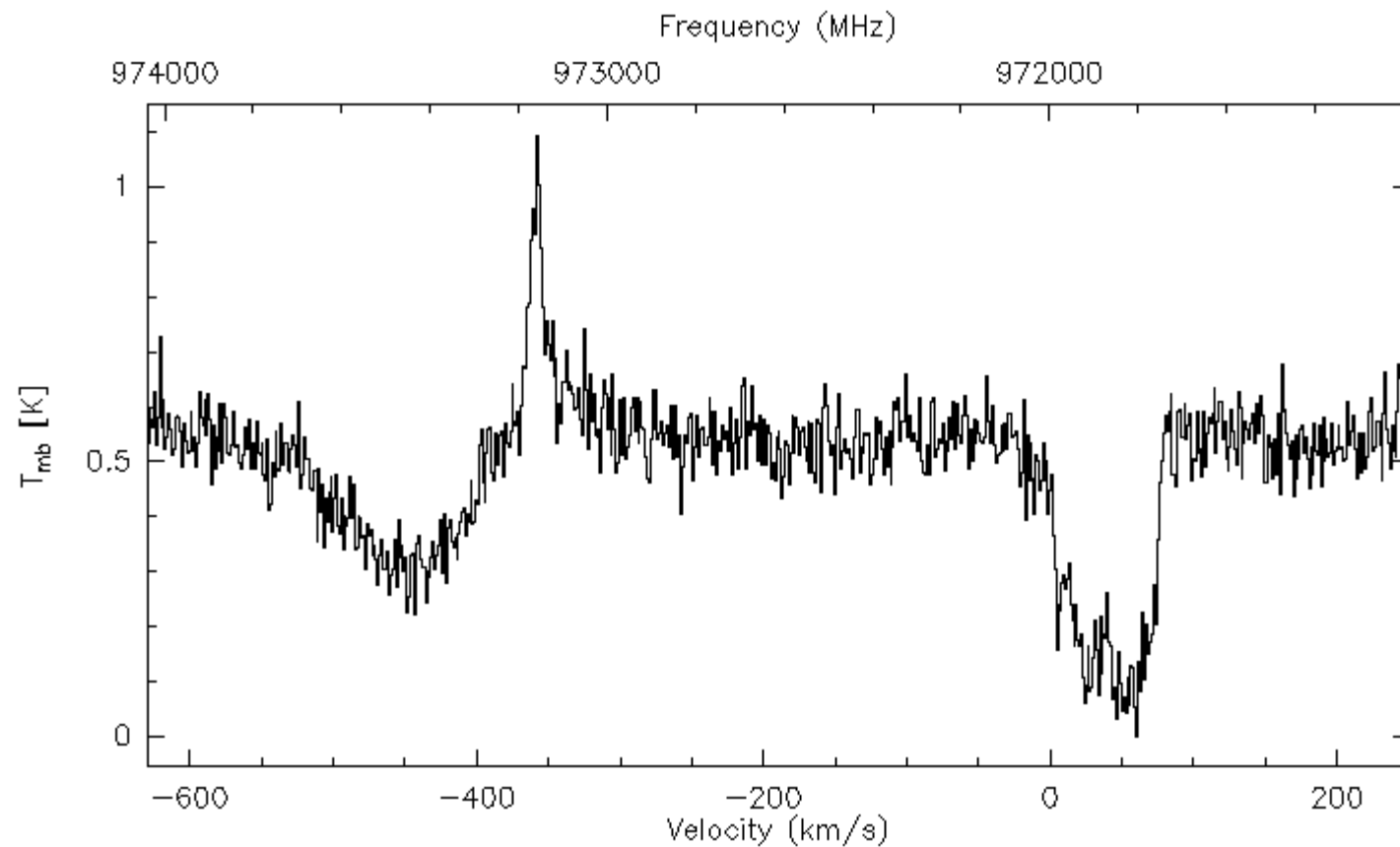
0;0 G32P80+0P19 OI 63 L SOF-HFAV 0 S 0:08-AUG-2021 R:27-OCT-2021  
RA: 18:50:30.62 DEC: -00:02:00.0 Eq 2000.0 Rad. 0.0° Offs: +0.1 -0.5  
Fair tau: 0.398 Tsys: 5272. Time: 57.4min El: 50.9  
N: 236 IQ: 80.8579 V0: 15.00 Dv: 1.203 LSR  
F0: 4744777.49 Df: -19.04 Fi: 4747325.08



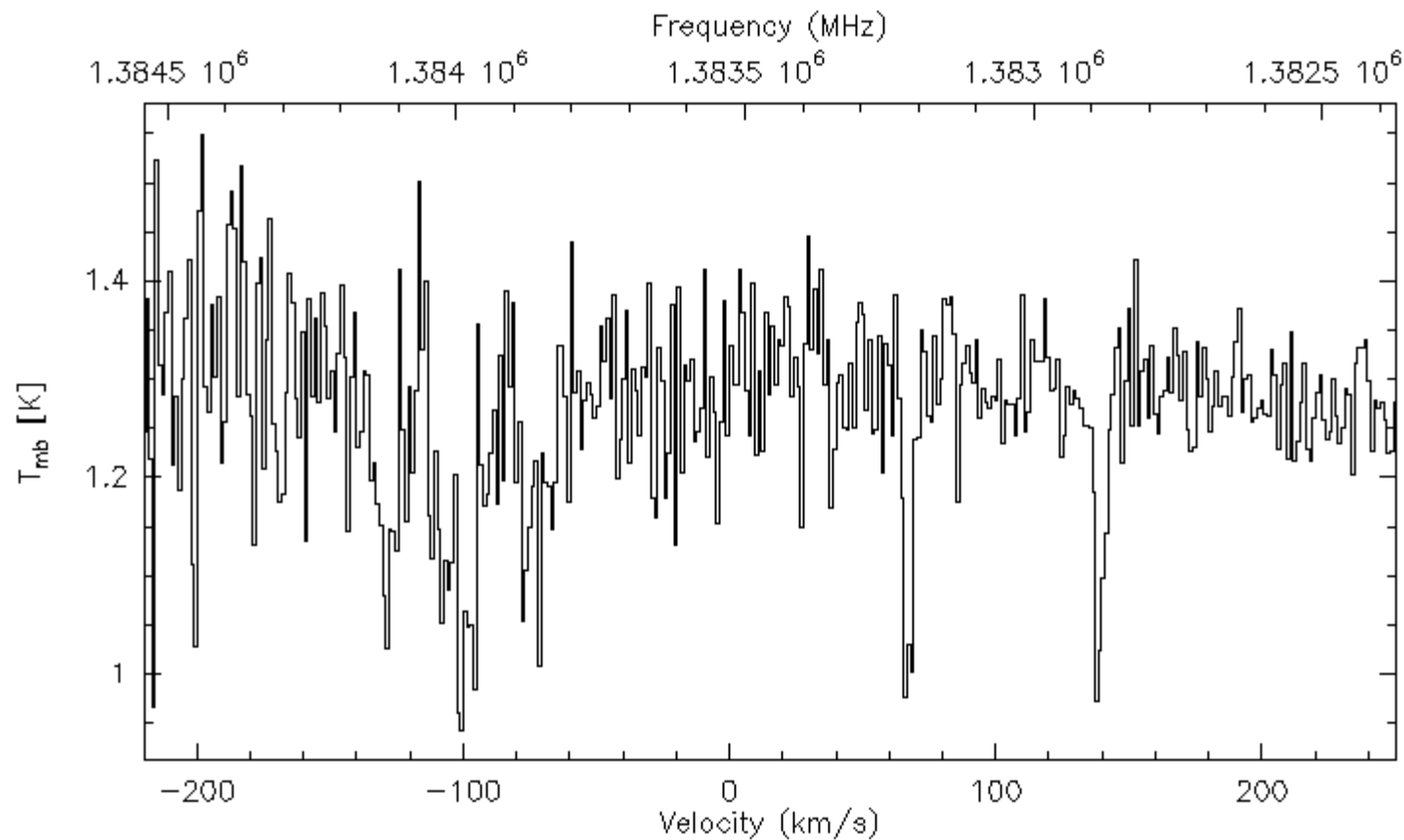
O;0 G45P07+0P13 ArH+(1-0) U SOF-4G1 O S O:24-JUL-2021 R:27-OCT-2021  
RA: 19:13:22.00 DEC: 10:50:54.0 Eq 2000.0 Rad. 0.0° Offs: -0.1 +3.7  
Excellent tau: 0.013 Tsys: 500. Time: 38.6min El: 37.9  
N: 1863 l0: 1077.86 V0: 60.00 Dv: 1.185 LSR  
F0: 617525.226 Df: -2.442 Fi: 606723.579



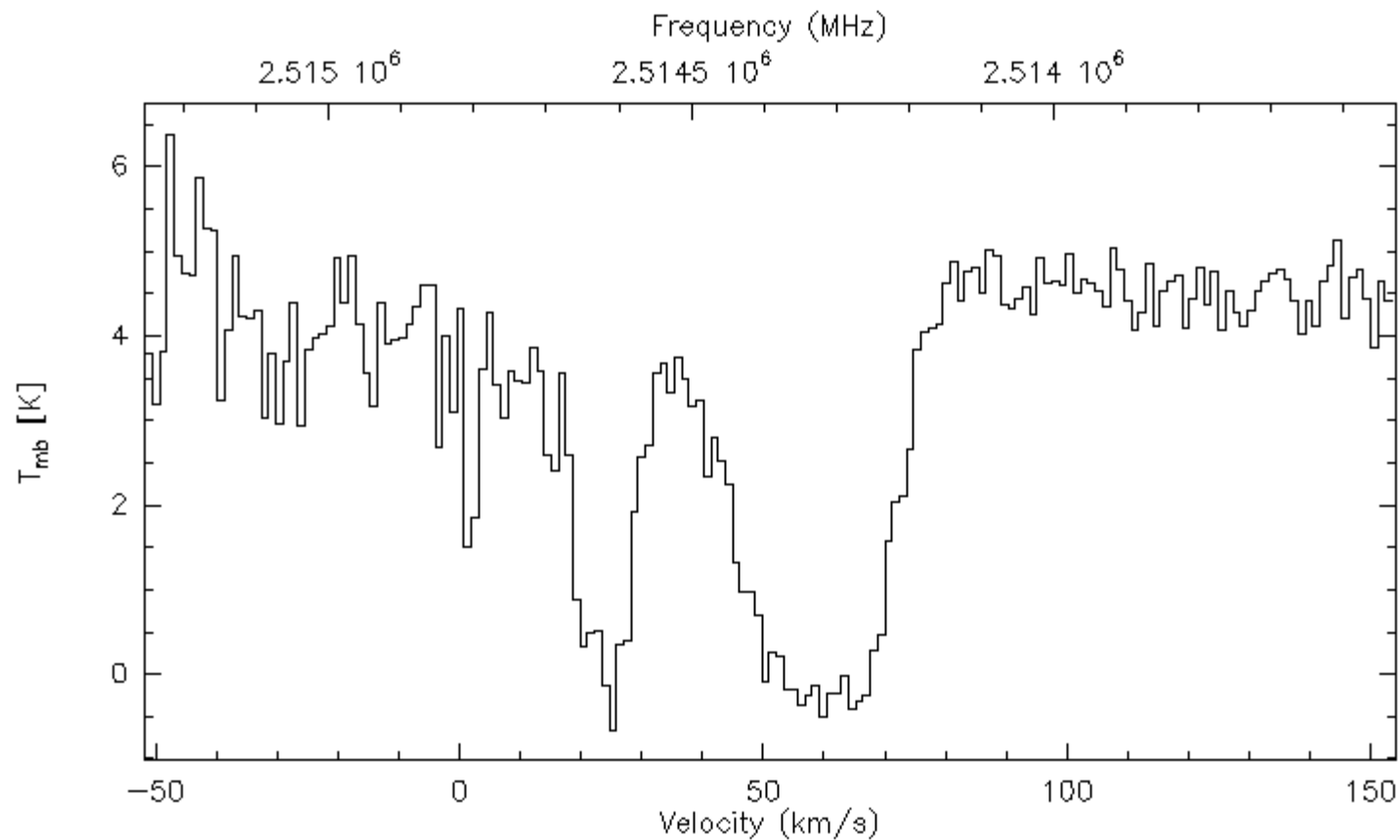
0;0 G45P07+0P13 OH+(12-01) U S0F-4G2 0 S O:24-JUL-2021 R:27-OCT-2021  
RA: 19:13:22.00 DEC: 10:50:54.0 Eq 2000.0 Rad. 0.0° Offs: +0.2 +2.0  
Excellent tau: 0.060 Tsys: 2319. Time: 38.6min El: 37.9  
N: 1048 I0: 588.794 V0: 60.00 Dv: 1.205 LSR  
F0: 971803.800 Df: -3.907 Fi: 960302.046



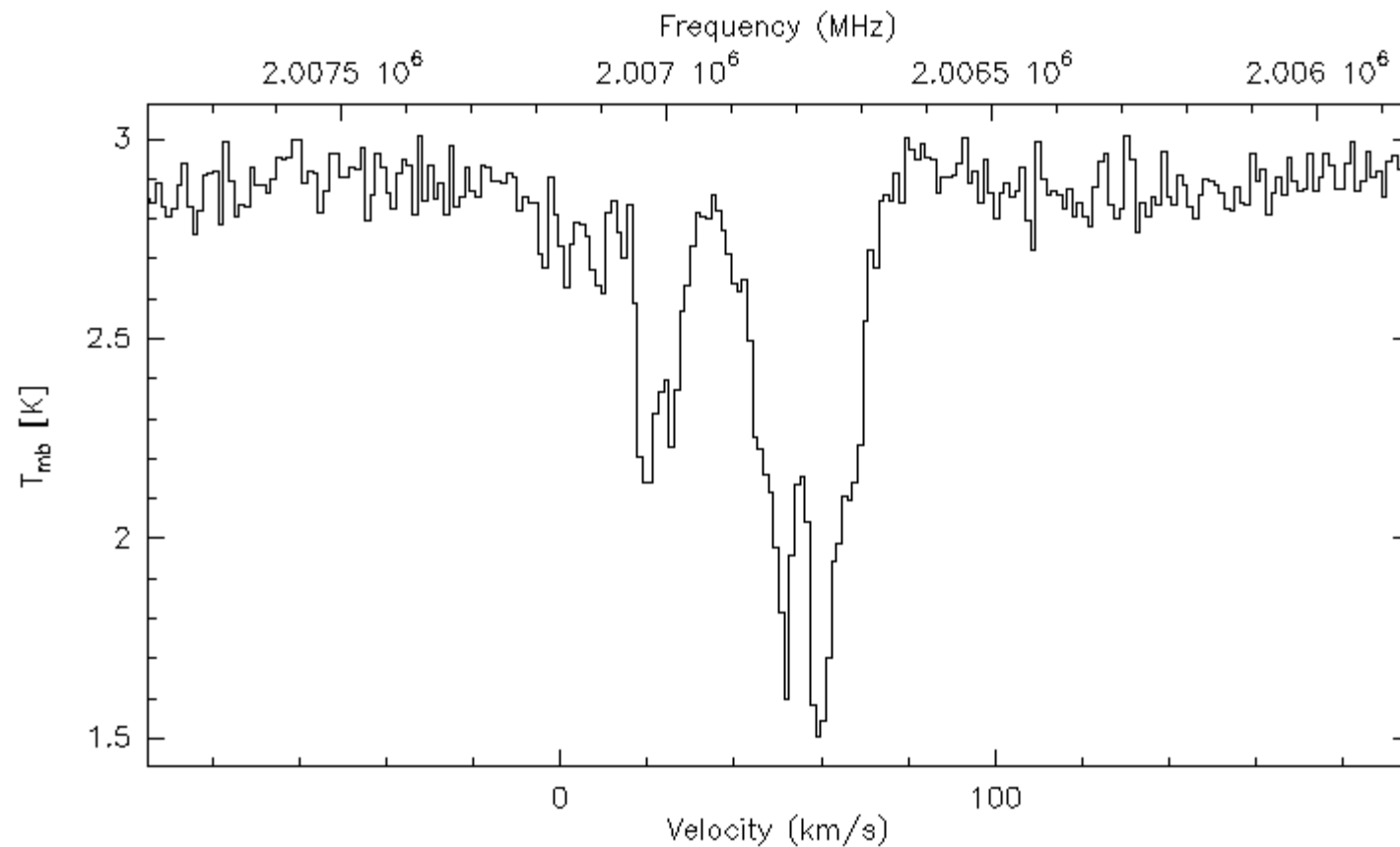
0:0 G45P07+0P13 SH U      SOF-4G3 O S    O:24-JUL-2021 R:27-OCT-2021  
RA: 19:13:22.00 DEC: 10:50:54.0 Eq 2000.0 Rad. 0.0° Offs: +0.6 +1.2  
Excellent tau: 0.066 Tsys: 4198. Time: 38.6min El: 37.9  
N: 736 l0: 262.080      V0: 60.00      Dv: -1.217      LSR  
F0: 1383250.00      Df: 5.616      Fi: 1380449.57



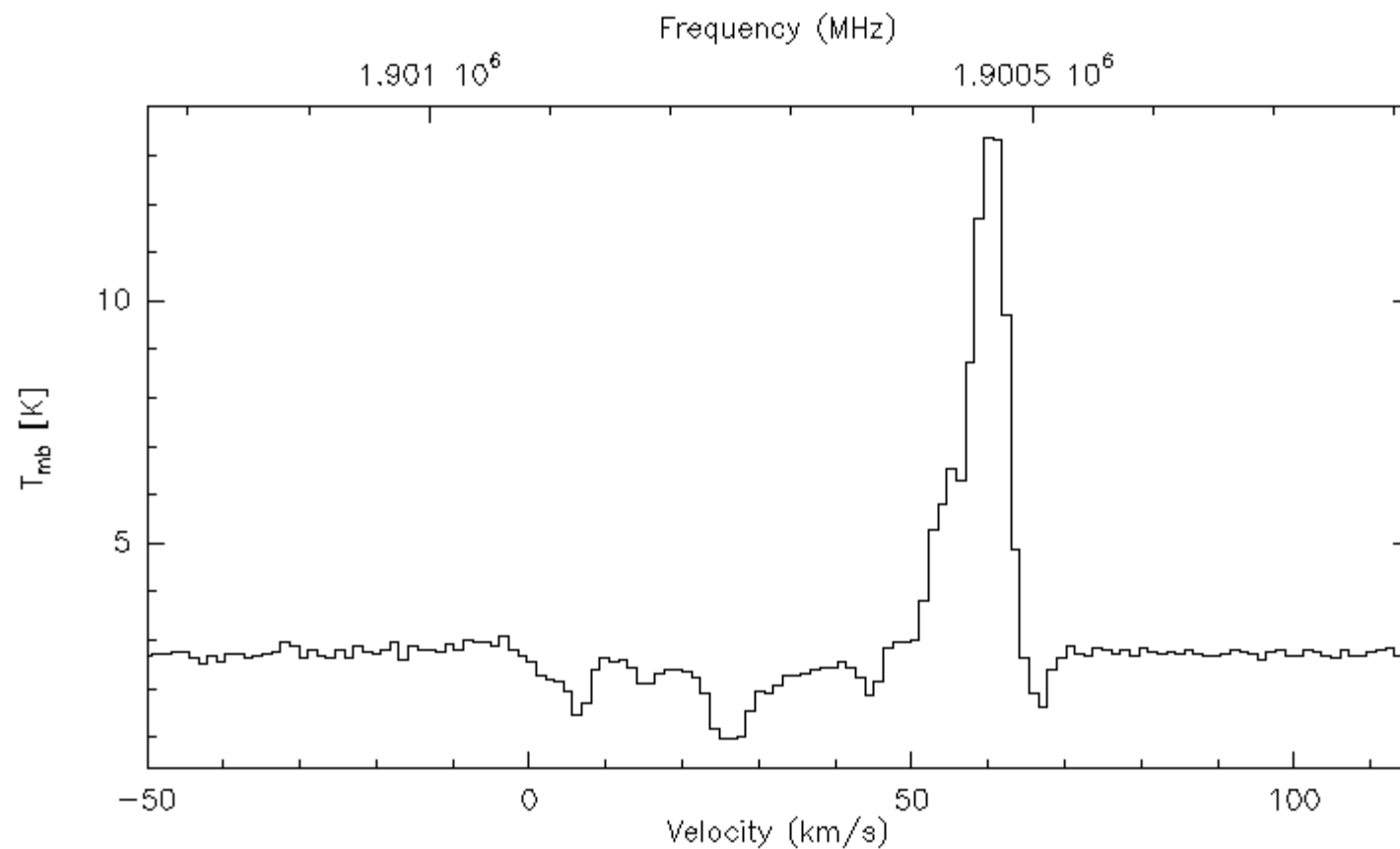
0;0 G45P07+0P13 OH 2PI32 HU SOF-4G4 0 S O:24-JUL-2021 R:27-OCT-2021  
RA: 19:13:22.00 DEC: 10:50:54.0 Eq 2000.0 Rad. 0.0° Offs: -0.0 -0.0  
Excellent tau: 0.078 Tsys: 22790. Time: 38.6min El: 37.9  
N: 424 l0: 162.883 v0: 60.00 Dv: -1.194 LSR  
F0: 2514316.71 Df: 10.01 Fi: 2511316.25



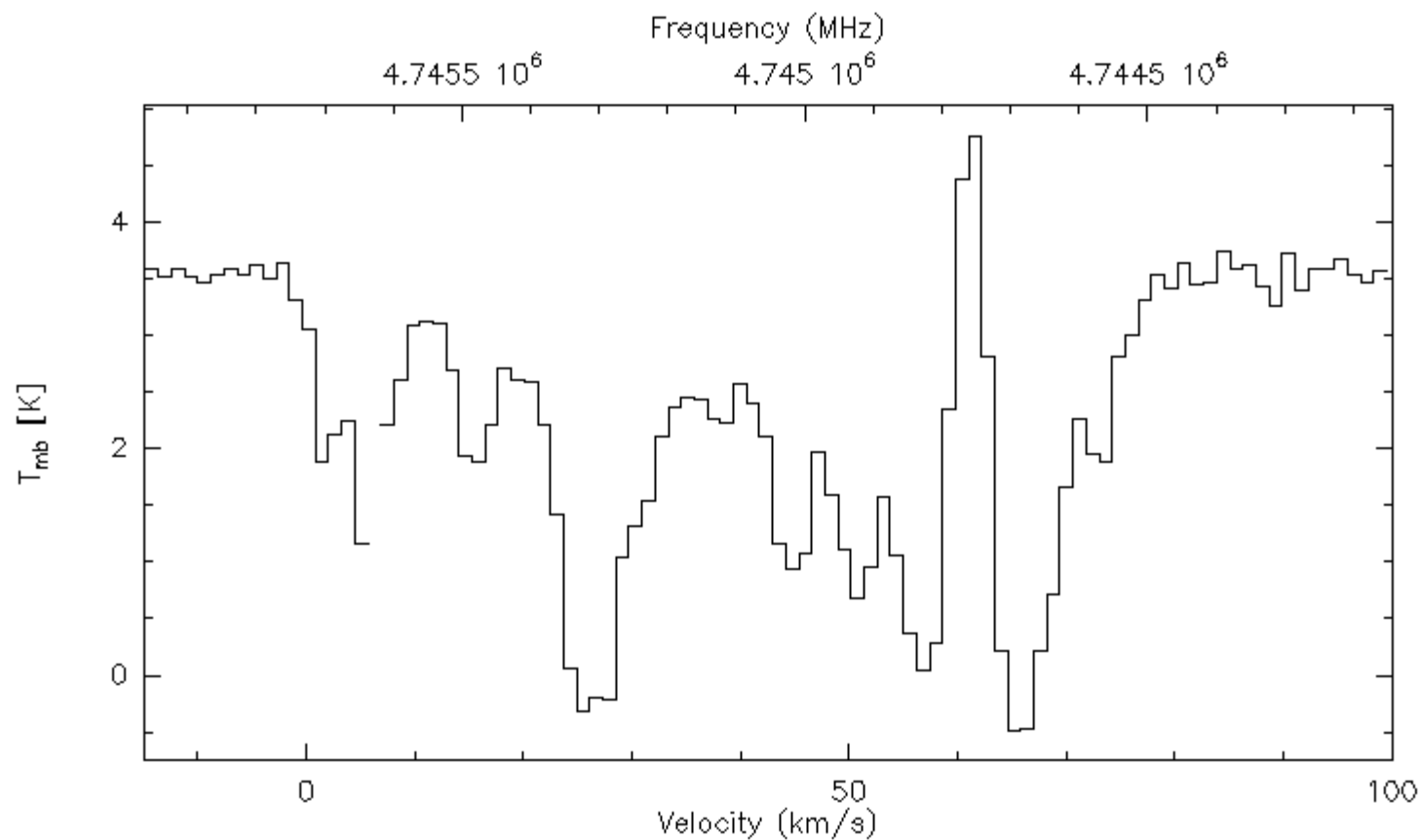
0;0 G45P07+0P13 CH 149 U SOF-LFA- 0 S O:12-AUG-2021 R:27-OCT-2021  
RA: 19:13:22.00 DEC: 10:50:54.0 Eq 2000.0 Rad. 0.0<sup>a</sup> Offs: +1.4 +0.2  
Good tau: 0.153 Tsys: 3140. Time: 23.0min El: 39.2  
N: 496 l0: 149.400 V0: 60.00 Dv: -1.204 LSR  
F0: 2006762.58 Df: 8.057 Fi: 2004362.15



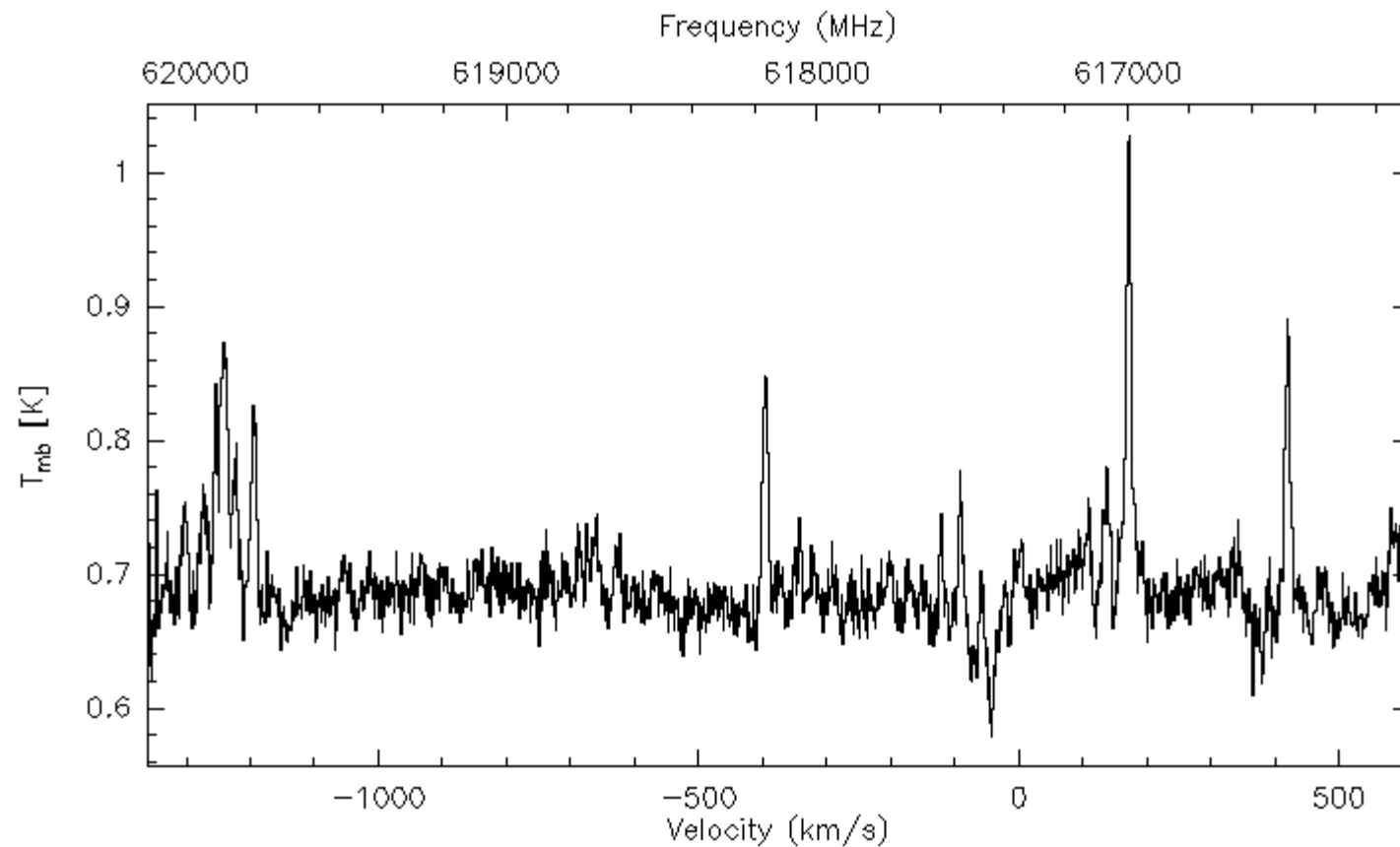
0;0 G45P07+0P13 CII U SOF-LFA- 0 S 0:12-AUG-2021 R:27-OCT-2021  
RA: 19:13:22.00 DEC: 10:50:54.0 Eq 2000.0 Rad. 0.0° Offs: +1.4 +0.2  
Good tau: 0.239 Tsys: 3474. Time: 14.7min El: 41.6  
N: 528 l0: 159.007 V0: 60.00 Dv: -1.194 LSR  
F0: 1900536.90 Df: 7.568 Fi: 1898136.47



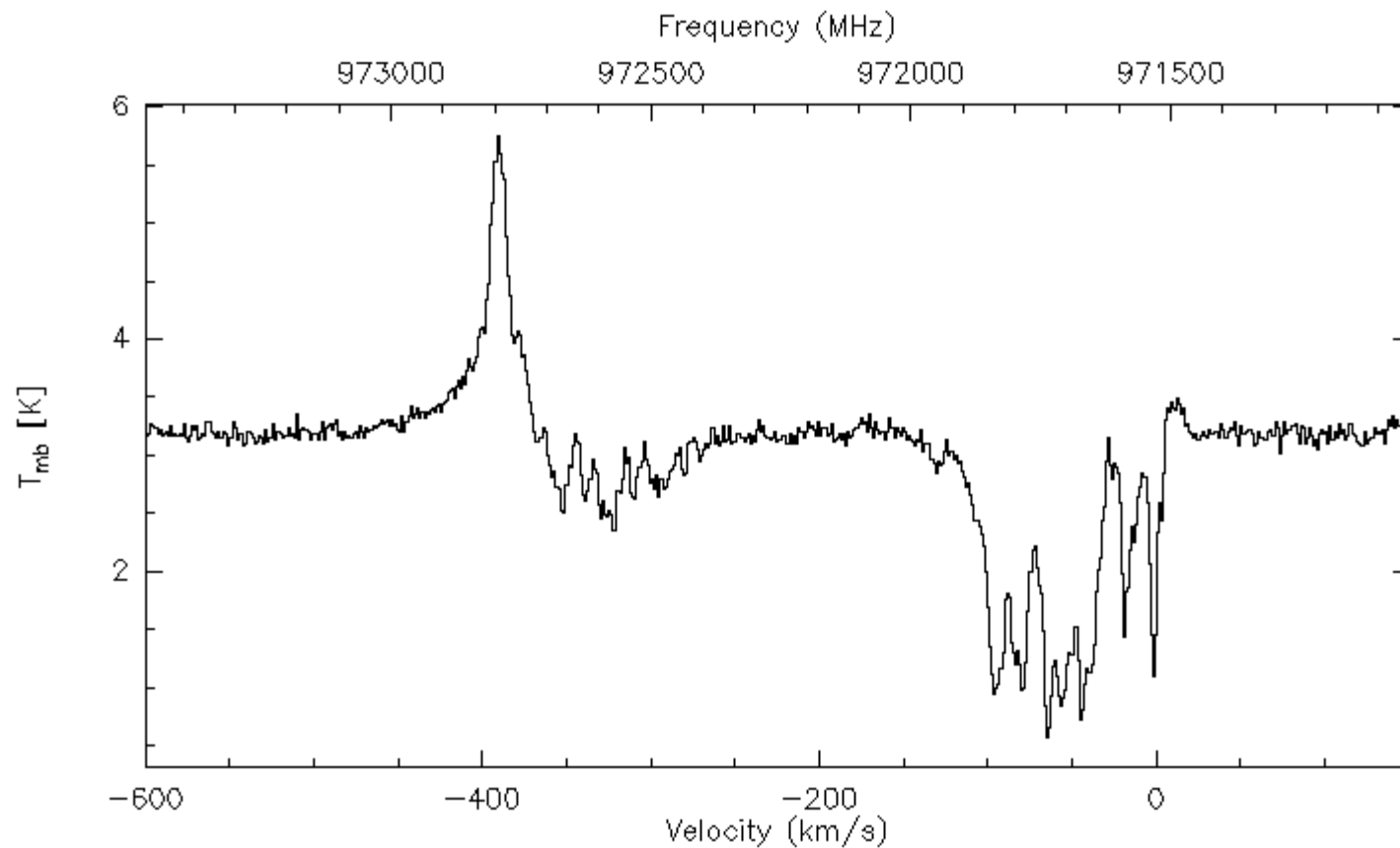
0;0 G45P07+0P13 OI 63 L SOF-HFAV 0 S 0:12-AUG-2021 R:27-OCT-2021  
RA: 19:13:22.00 DEC: 10:50:54.0 Eq 2000.0 Rad. 0.0° Offs: -0.7 -1.5  
Average tau: 0.724 Tsys: 5581. Time: 18.8min El: 40.1  
N: 242 IQ: 84.6475 V0: 60.00 Dv: 1.203 LSR  
F0: 4744777.49 Df: -19.05 Ff: 4747153.35



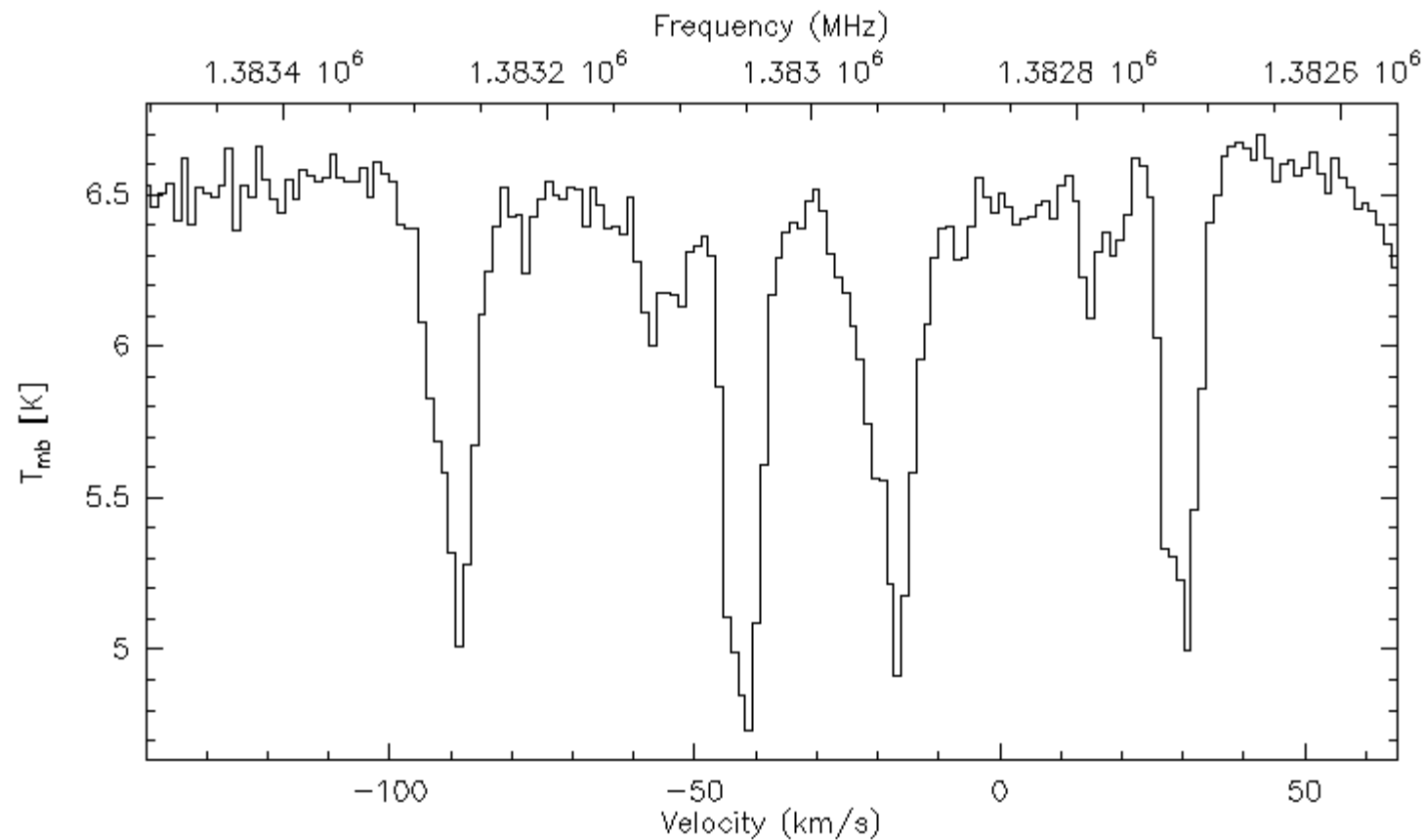
O;0 I16060-5146 ArH+(1-0) U SOF-4G1 O S O:24-JUL-2021 R:27-OCT-2021  
RA: 16:09:52.41 DEC: -51:54:58.5 Eq 2000.0 Rad. 0.0° Offs: -0.1 +3.7  
Excellent tau: 0.034 Tsys: 496. Time: 38.6min El: 41.4  
N: 1663 IQ: 1077.86 V0: -85.00 Dv: 1.185 LSR  
FO: 617525.226 Df: -2.441 Fi: 606727.631



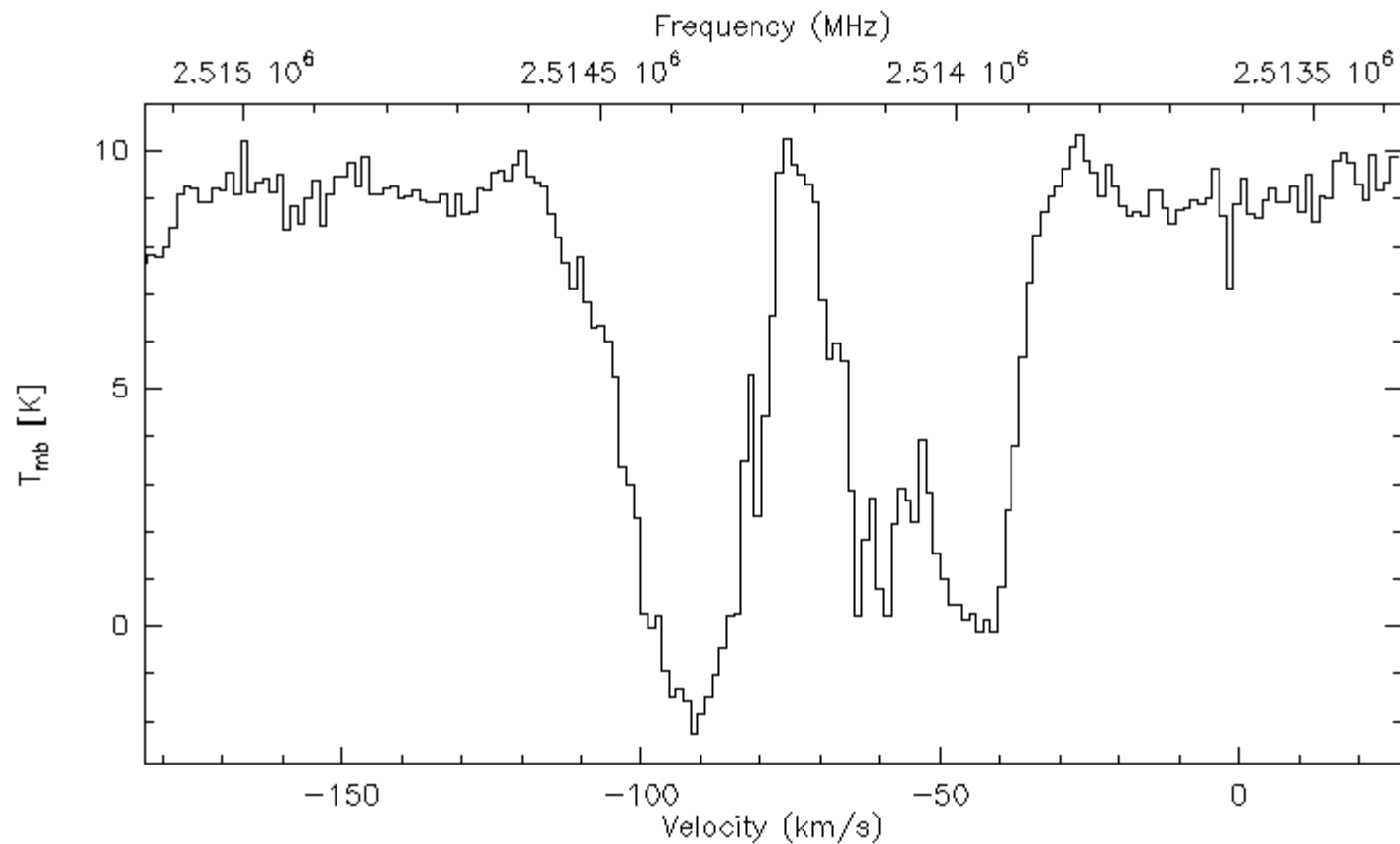
O;0 I16060-5146 OH+(12-01) U S0F-4G2 O S O:24-JUL-2021 R:27-OCT-2021  
RA: 16:09:52.41 DEC: -51:54:58.5 Eq 2000.0 Rad. 0.0° Offs: +0.2 +2.0  
Good tau: 0.201 Tsys: 2391. Time: 38.6min El: 41.4  
N: 1048 IQ: 588.798 V0: -85.00 Dv: 1.205 LSR  
FO: 971803.800 Df: -3.906 Fi: 960306.361



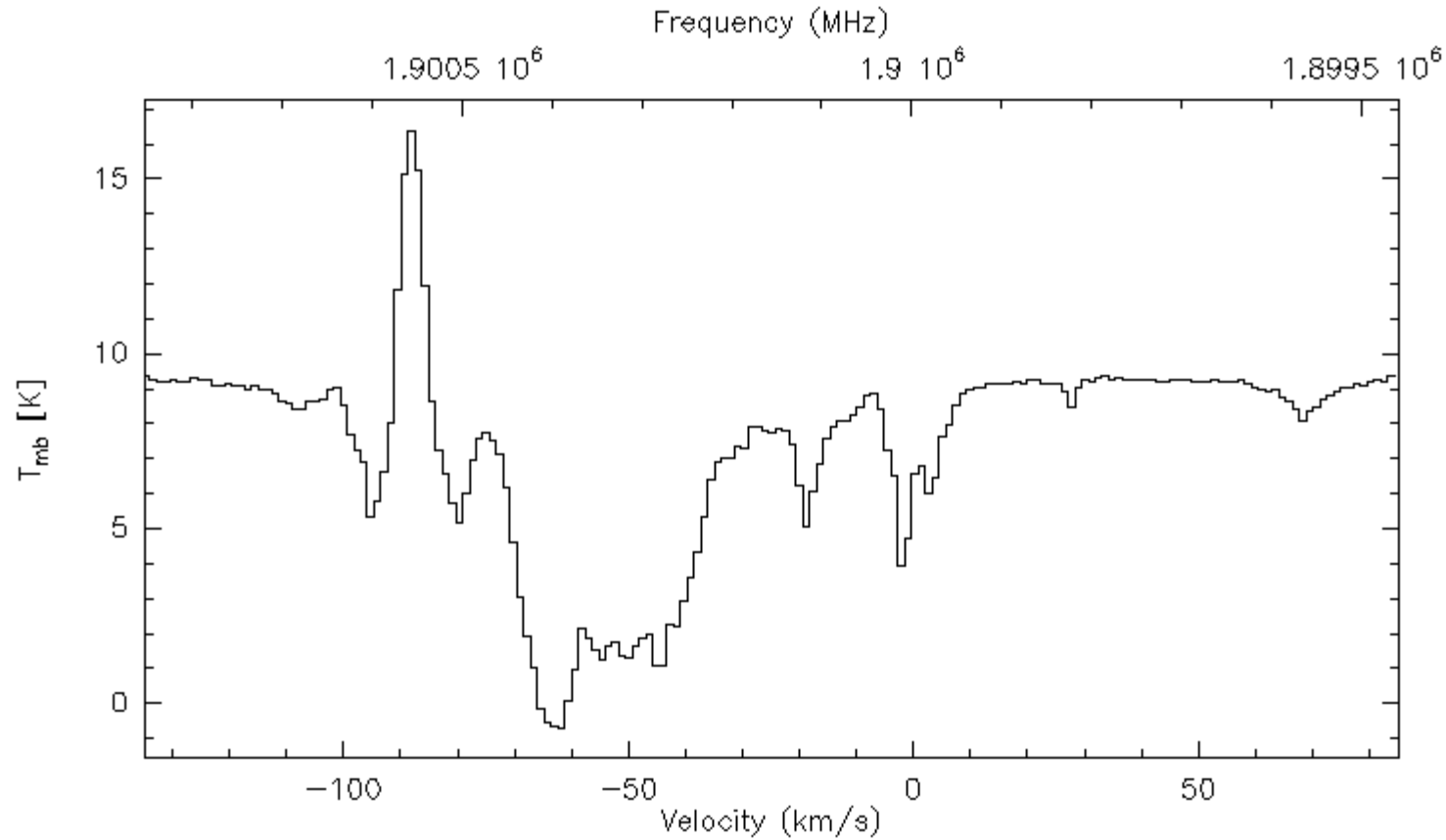
0;0 116060-5146 SH U      SOF-4G3 0 S    0:24-JUL-2021 R:27-OCT-2021  
RA: 16:09:52.41 DEC: -51:54:58.5 Eq 2000.0 Rad. 0.0° Offs: +0.6 +1.2  
Excellent tau: 0.069 Tsys: 4326. Time: 38.6min El: 41.4  
N: 737 l0: 262.084      V0: -85.00      Dv: -1.217      LSR  
FO: 1383250.00      Df: 5.614      Fi: 1380450.62



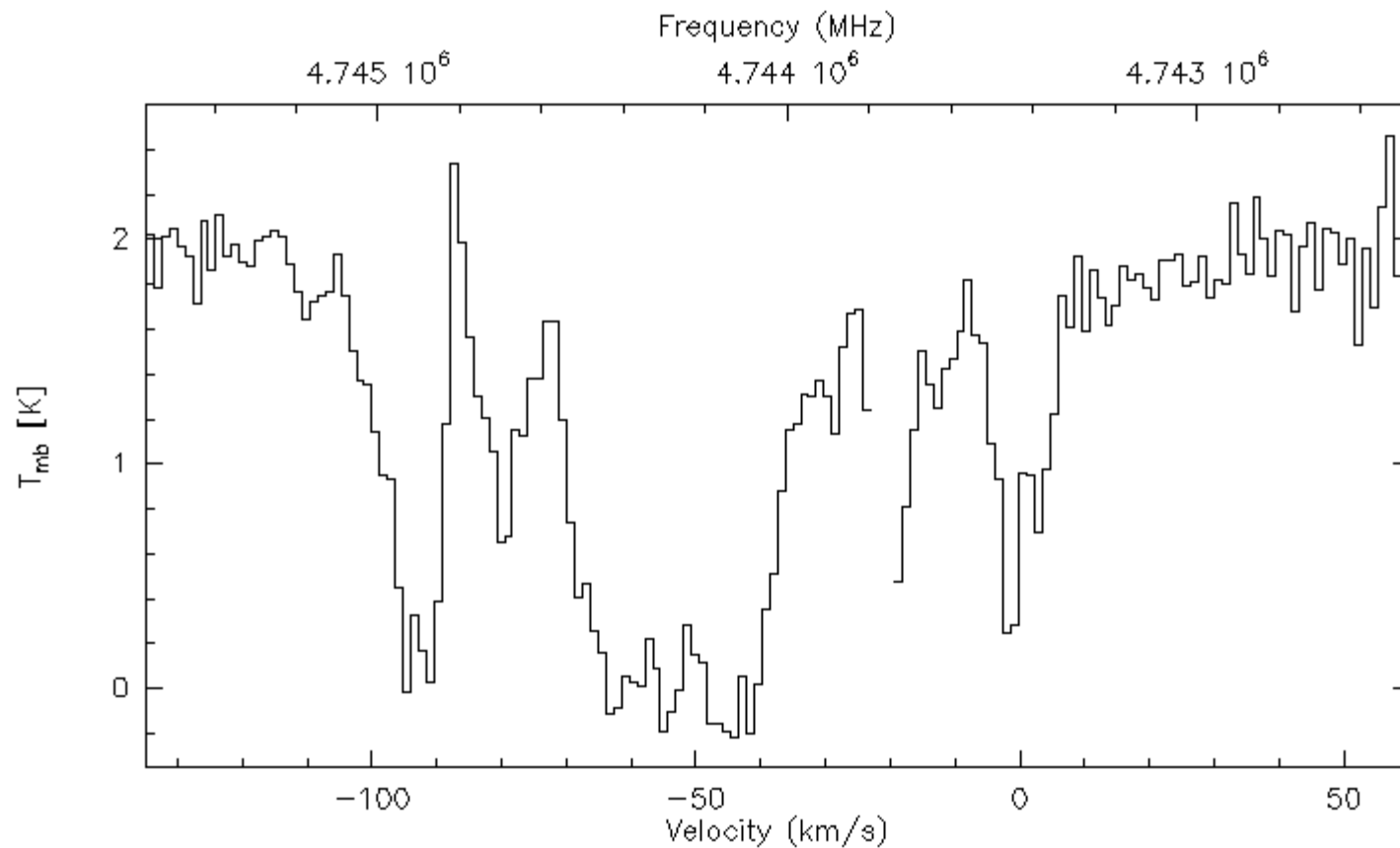
O:0 116060-5146 OH 2PI32 HU SOF-4G4 0 S O:24-JUL-2021 R:27-OCT-2021  
RA: 16:09:52.41 DEC: -51:54:58.5 Eq 2000.0 Rad. 0.0° Offs: +0.0 -0.0  
Good tau: 0.111 Tsys: 22176. Time: 38.6min El: 41.4  
N: 424 l0: 162.887 V0: -85.00 Dv: -1.193 LSR  
F0: 2514316.71 Df: 10.01 Fi: 2511317.37



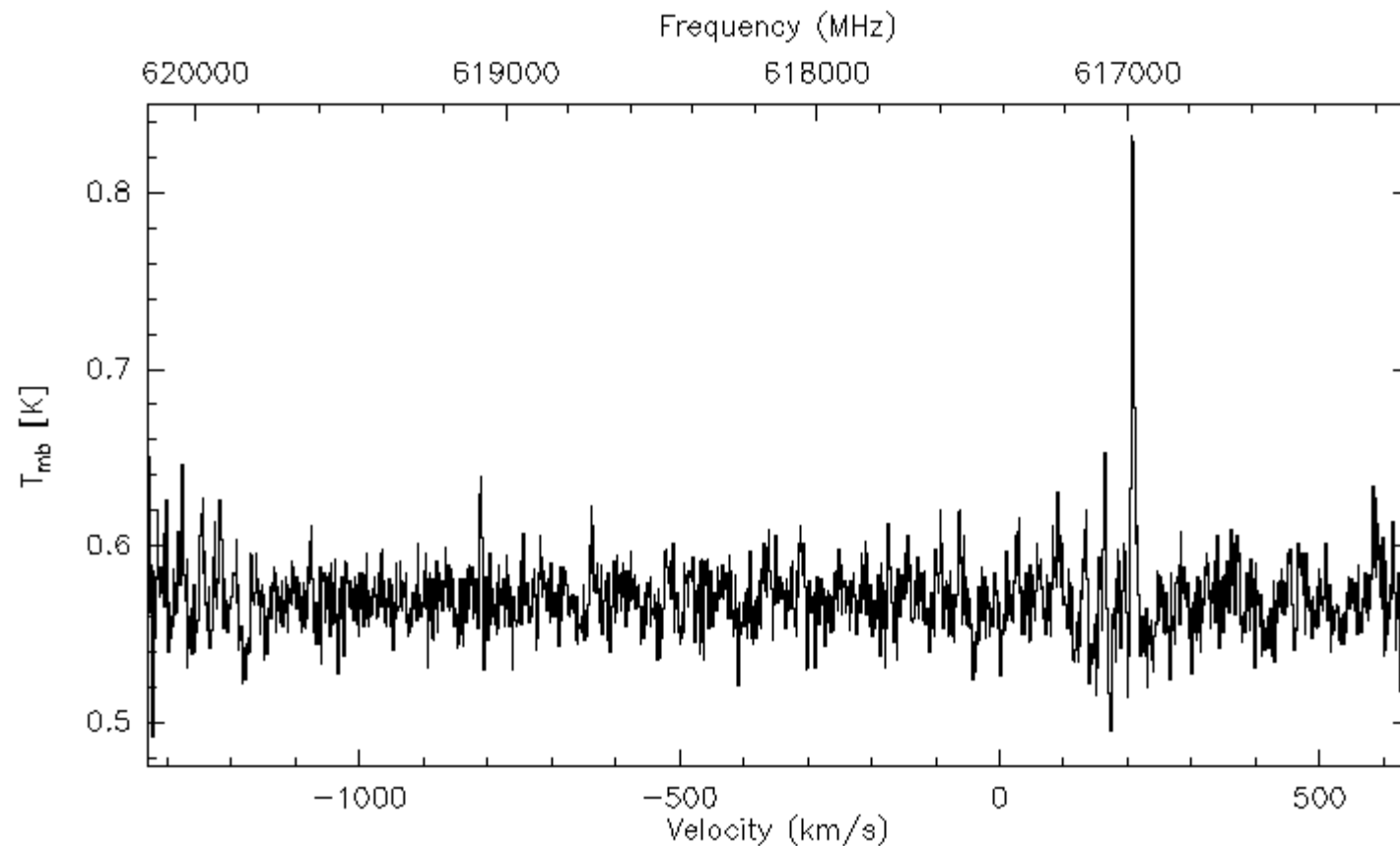
O;0 I16060-5146 CII U SOF-LFA- O S O:08-AUG-2021 R:27-OCT-2021  
RA: 16:09:52.41 DEC: -51:54:58.5 Eq 2000.0 Rad. 0.0° Offs: +1.4 +0.2  
Good tau: 0.253 Tsys: 3371. Time: 46.8min El: 33.4  
N: 528 l0: 185.432 V0: -85.00 Dv: -1.194 LSR  
FO: 1900536.90 Df: 7.568 Fi: 1897737.49



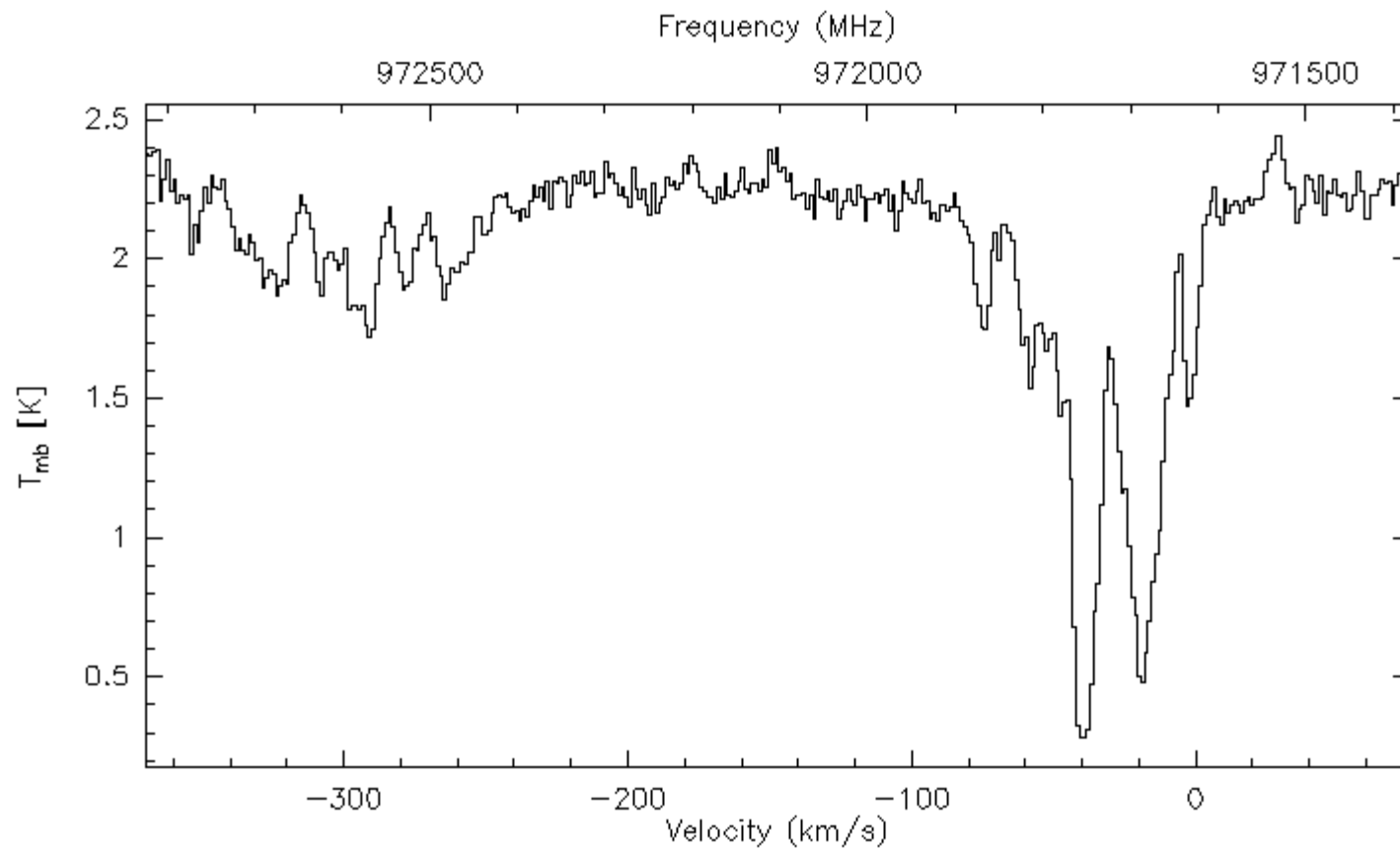
0;0 116060-5146 OI 63 L SOF-HFAV O S 0:08-AUG-2021 R:27-OCT-2021  
RA: 16:09:52.41 DEC: -51:54:58.5 Eq 2000.0 Rad. 0.0° Offs: -0.7 -1.5  
Fair tau: 0.389 Tsys: 5276. Time: 23.4min El: 33.4  
N: 210 I0: 64.9614 V0: -85.00 Dv: 1.203 LSR  
F0: 4744777.49 Df: -19.04 Ff: 4747232.20



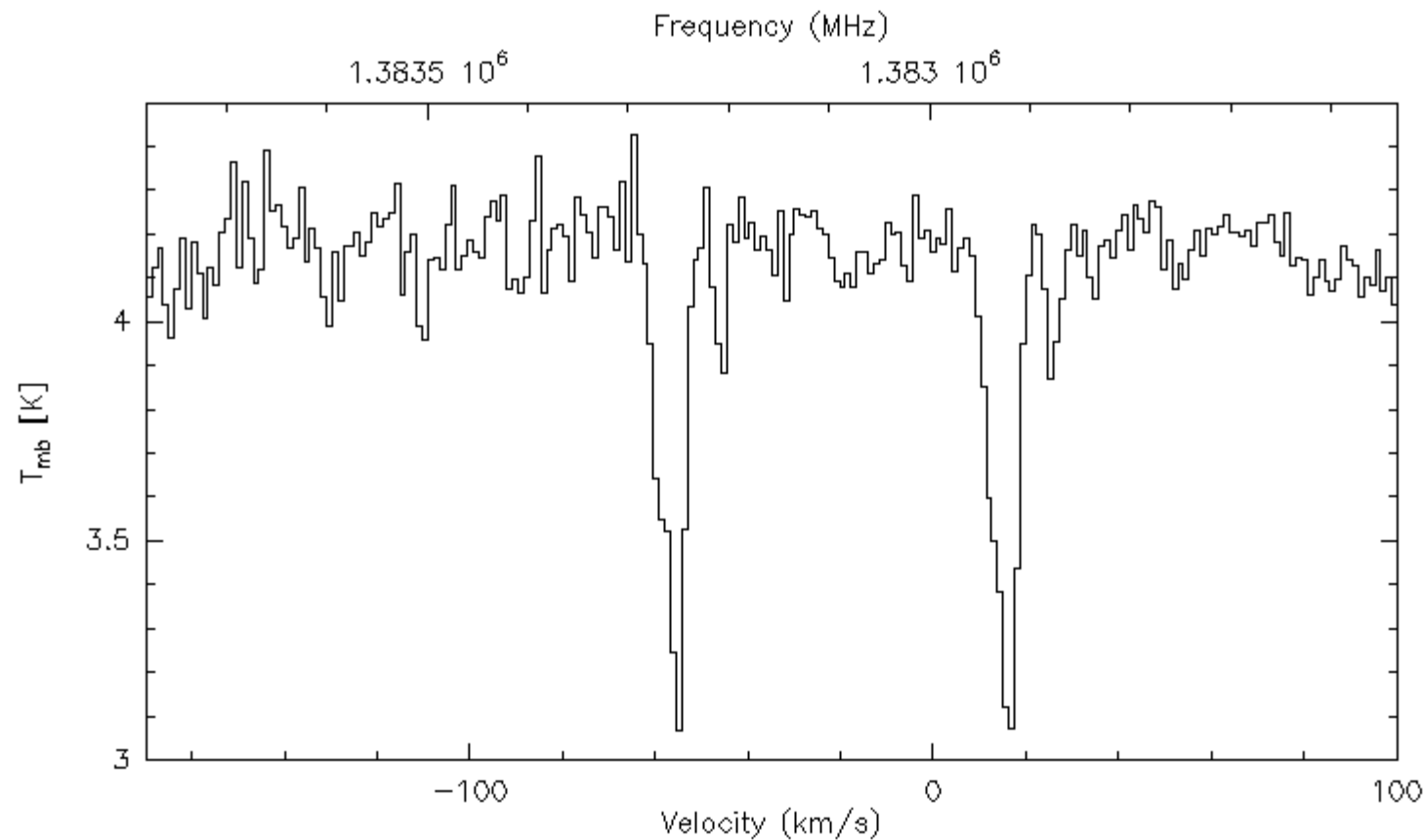
O;0 I16164-5046 ArH+(1-0) U SOF-4G1 O S O:27-JUL-2021 R:27-OCT-2021  
RA: 16:20:11.89 DEC: -50:53:17.0 Eq 2000.0 Rad. 0.0° Offs: -0.1 +3.7  
Excellent tau: 0.035 Tsys: 511. Time: 37.6min El: 42.6  
N: 1663 IQ: 1077.86 V0: -55.00 Dv: 1.185 LSR  
FO: 617525.226 Df: -2.441 Fi: 606726.547



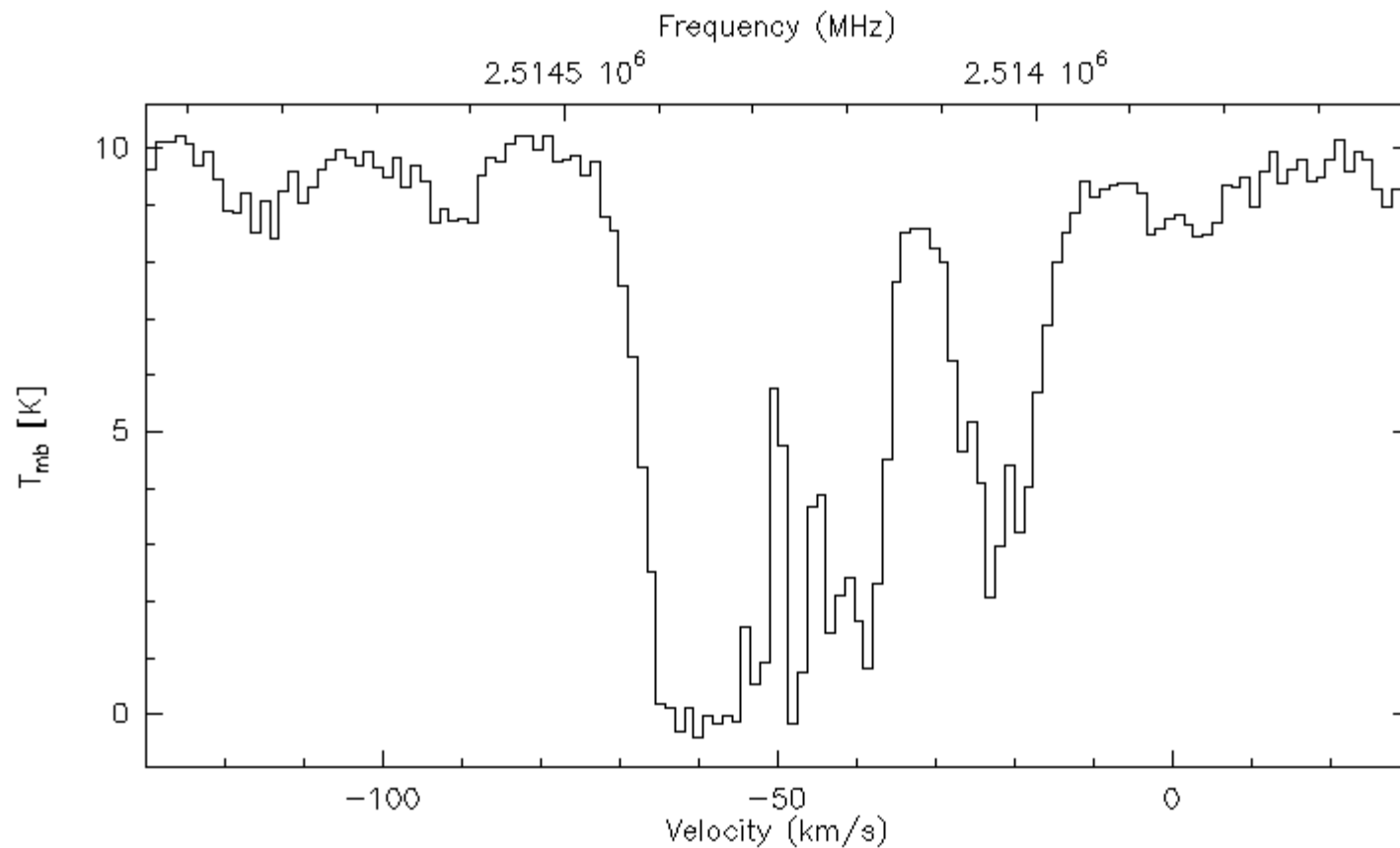
0;0 116164-5046 OH+(12-01) U S0F-4G2 0 S 0:27-JUL-2021 R:27-OCT-2021  
RA: 16:20:11.89 DEC: -50:53:17.0 Eq 2000.0 Rad. 0.0° Offs: +0.2 +2.0  
Good tau: 0.254 Tsys: 2030. Time: 37.6min El: 42.6  
N: 1048 IQ: 588.797 V0: -55.00 Dv: 1.205 LSR  
F0: 971803.800 Df: -3.906 Fi: 960305.207



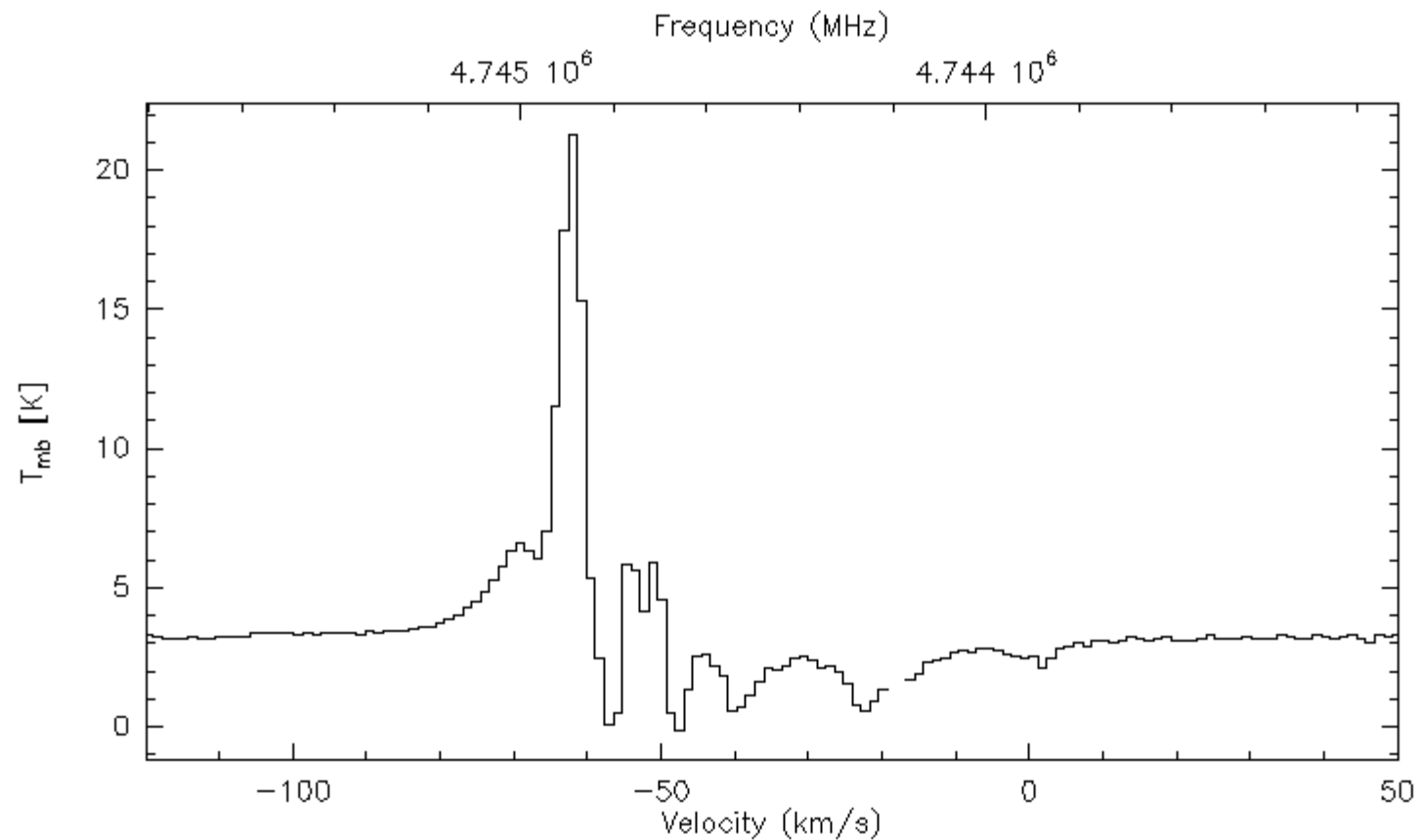
0;0 116164-5046 SH U      SOF-4G3 0 S    0:27-JUL-2021 R:27-OCT-2021  
RA: 16:20:11.89 DEC: -50:53:17.0 Eq 2000.0 Rad. 0.0° Offs: +0.6 +1.2  
Excellent tau: 0.073 Tsys: 4363. Time: 37.6min El: 42.6  
N: 736 l0: 262.083      V0: -55.00      Dv: -1.217      LSR  
FO: 1383250.00      Df: 5.615      Fi: 1380450.34



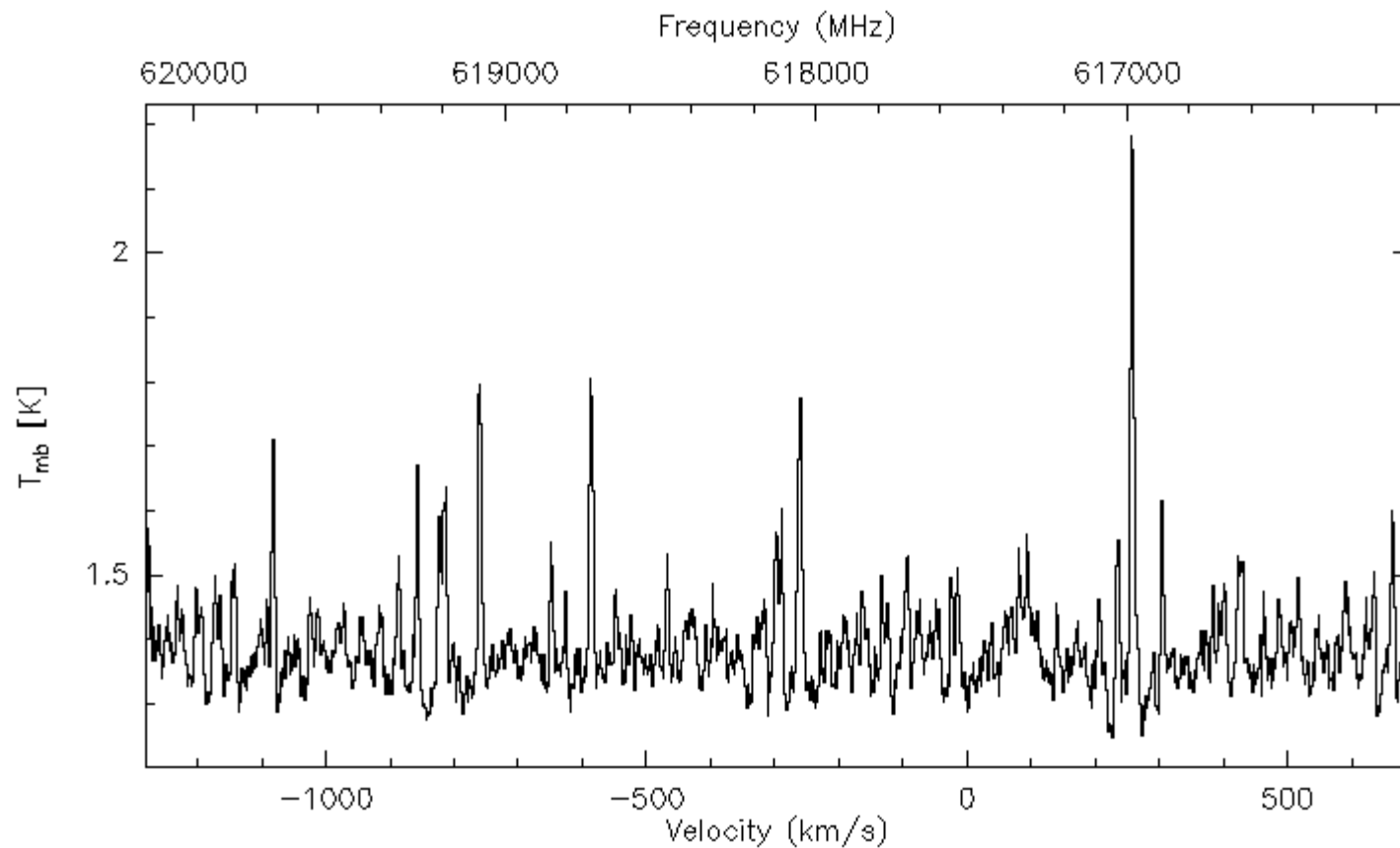
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RA: 16:20:11.89 DEC: -50:53:17.0 Eq 2000.0 Rad. 0.0° Offs: +0.0 +0.0  
Good tau: 0.112 Tsys: 22315. Time: 37.6min El: 42.6  
N: 424 l0: 162.886 V0: -55.00 Dv: -1.193 LSR  
FO: 2514316.71 Df: 10.01 Fi: 2511317.07



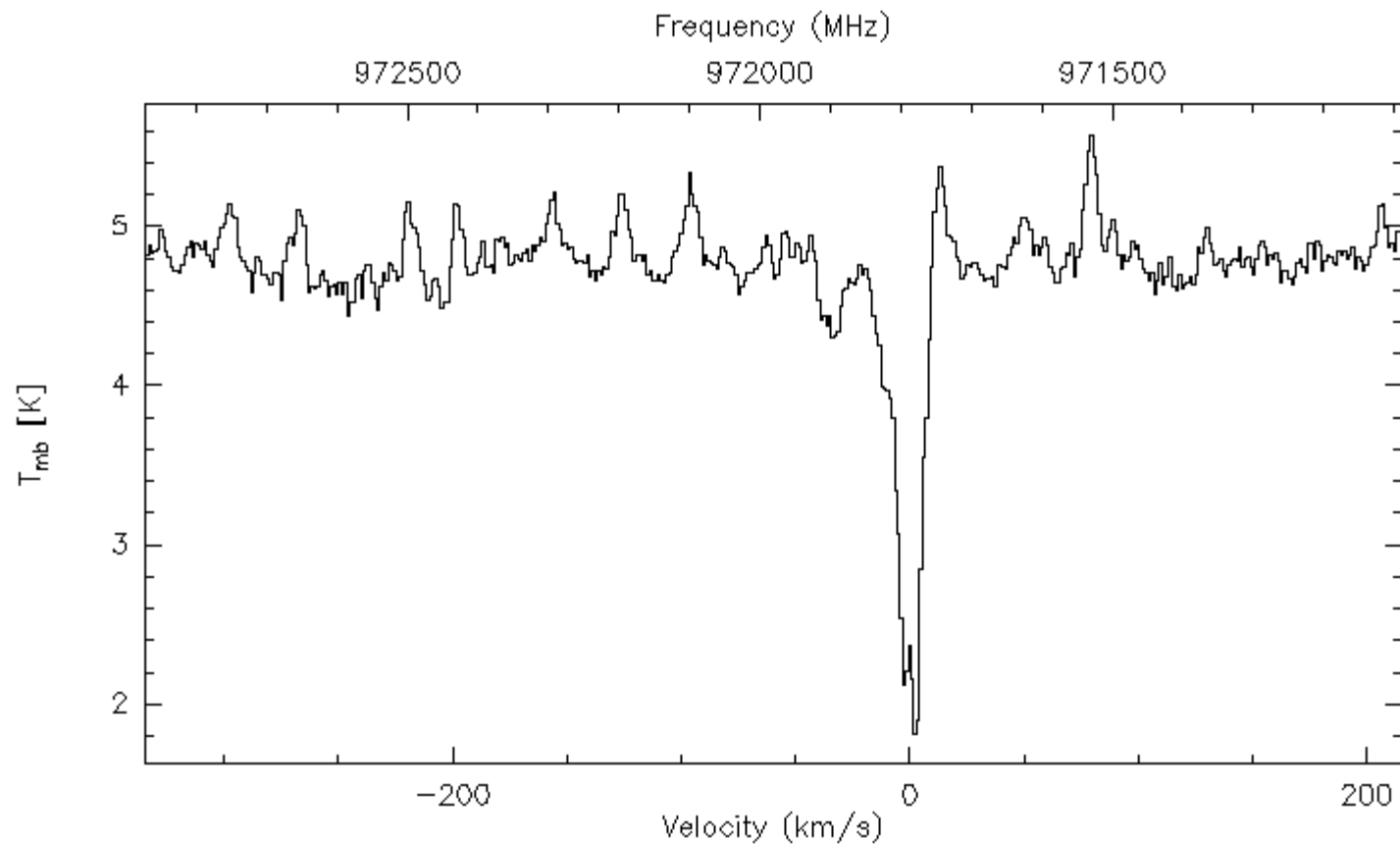
0;0 116164-5046 OI 63 L SOF-HFAV 0 S 0:27-JUL-2021 R:27-OCT-2021  
RA: 16:20:11.89 DEC: -50:53:17.0 Eq 2000.0 Rad. 0.0° Offs: +0.1 -0.5  
Fair tau: 0.467 Tsys: 4935. Time: 37.6min El: 42.6  
N: 236 l0: 82.7596 V0: -55.00 Dv: 1.203 LSR  
F0: 4744777.49 Df: -19.04 F1: 4747423.18



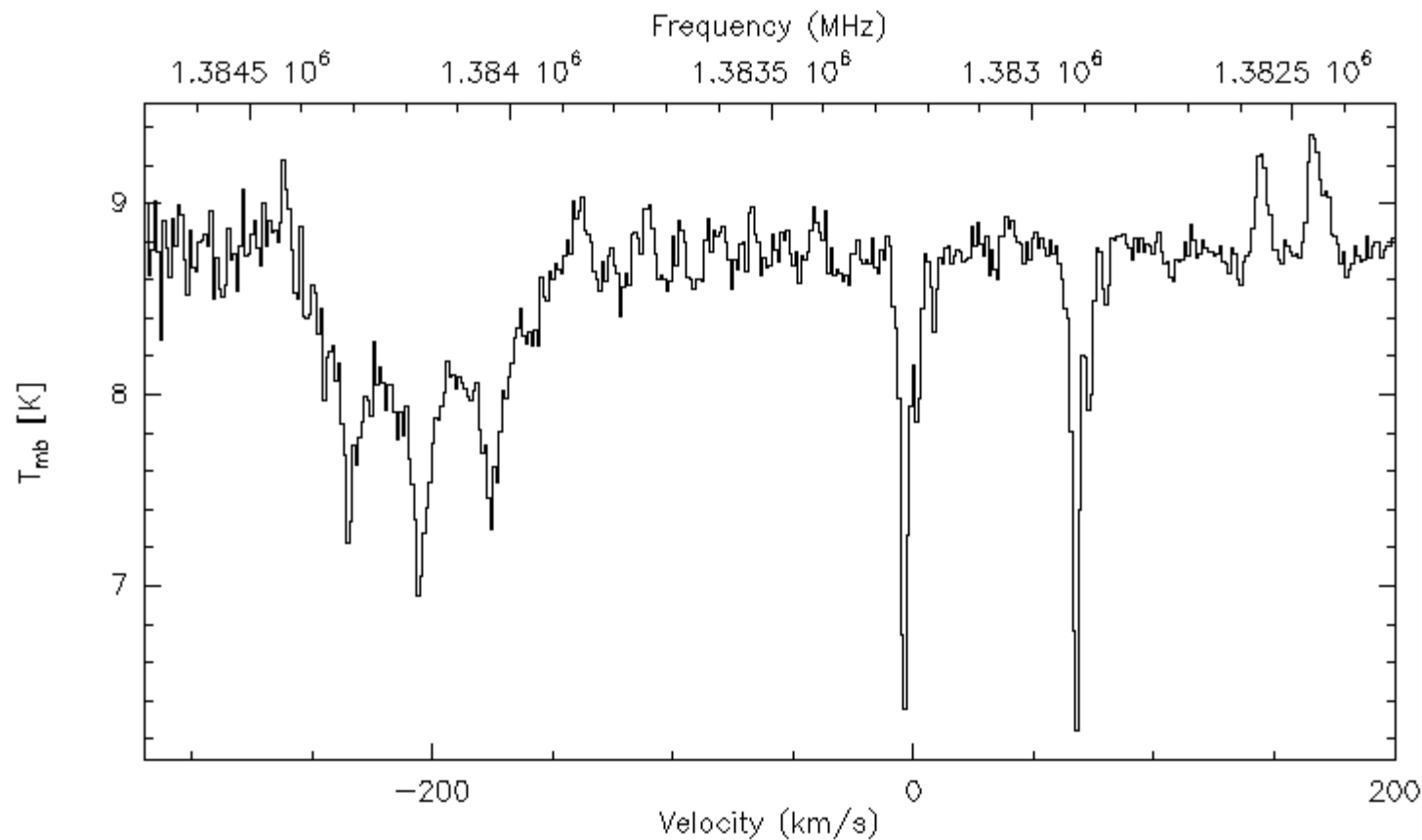
0;0 NGC6334 I ArH+(1-0) U SOF-4G1 0 S 0:27-JUL-2021 R:27-OCT-2021  
RA: 17:20:53.35 DEC: -35:47:01.5 Eq 2000.0 Rad. 0.0° Offs: -0.2 +3.7  
Excellent tau: 0.010 Tsys: 501. Time: 36.7min El: 34.8  
N: 1663 IQ: 1077.86 V0: -5.000 Dv: 1.185 LSR  
F0: 617525.226 Df: -2.442 Fi: 606725.026



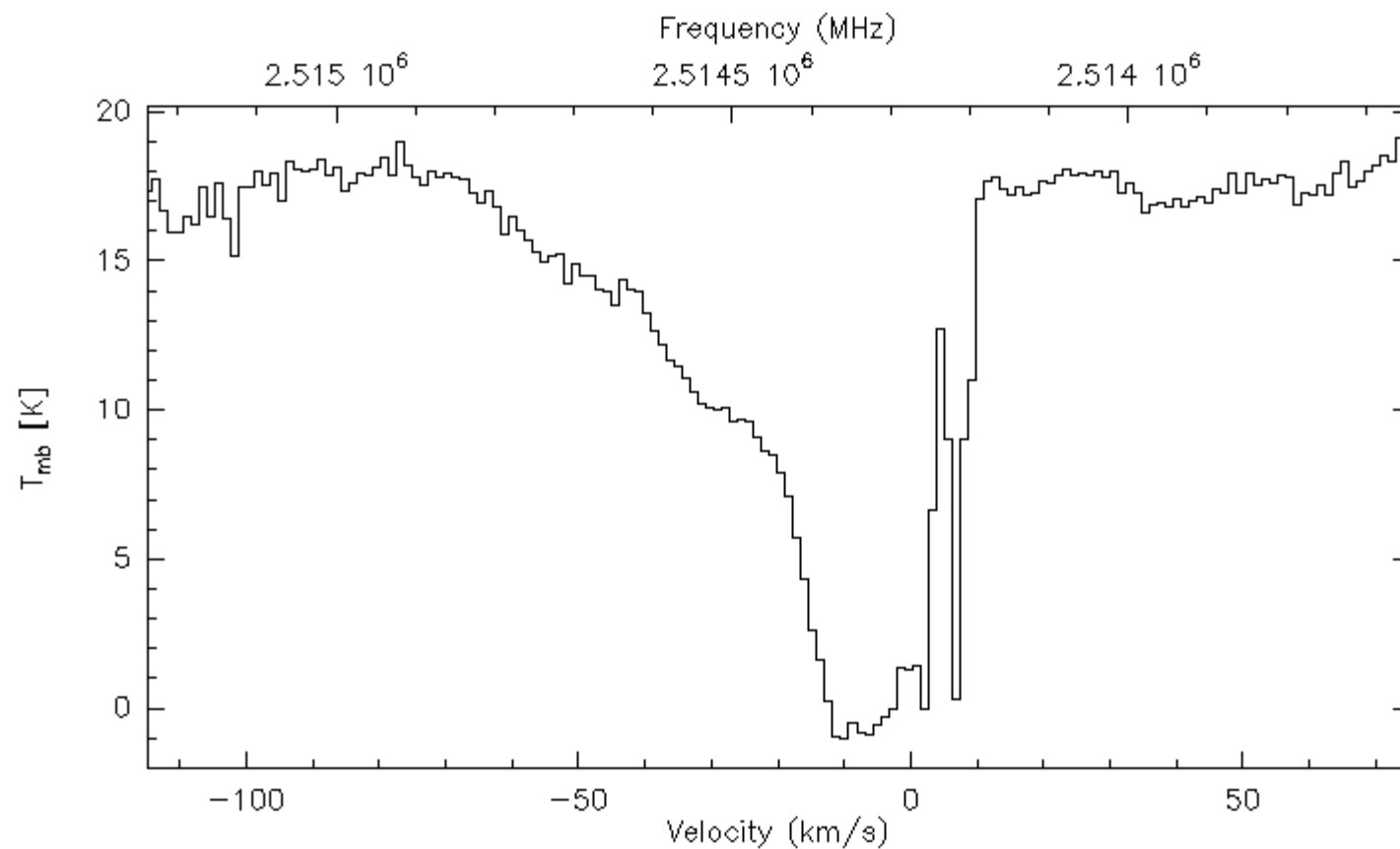
O;O NGC6334 I OH+(12-01) U SOF-4G2 O S 0:27-JUL-2021 R:27-OCT-2021  
RA: 17:20:53.35 DEC: -35:47:01.5 Eq 2000.0 Rad. 0.0° Offs: +0.2 +2.0  
Excellent tau: 0.051 Tsys: 2127. Time: 36.7min El: 34.8  
N: 1048 IQ: 588.795 V0: -5.000 Dv: 1.205 LSR  
FO: 971803.800 Df: -3.907 Fi: 960303.587



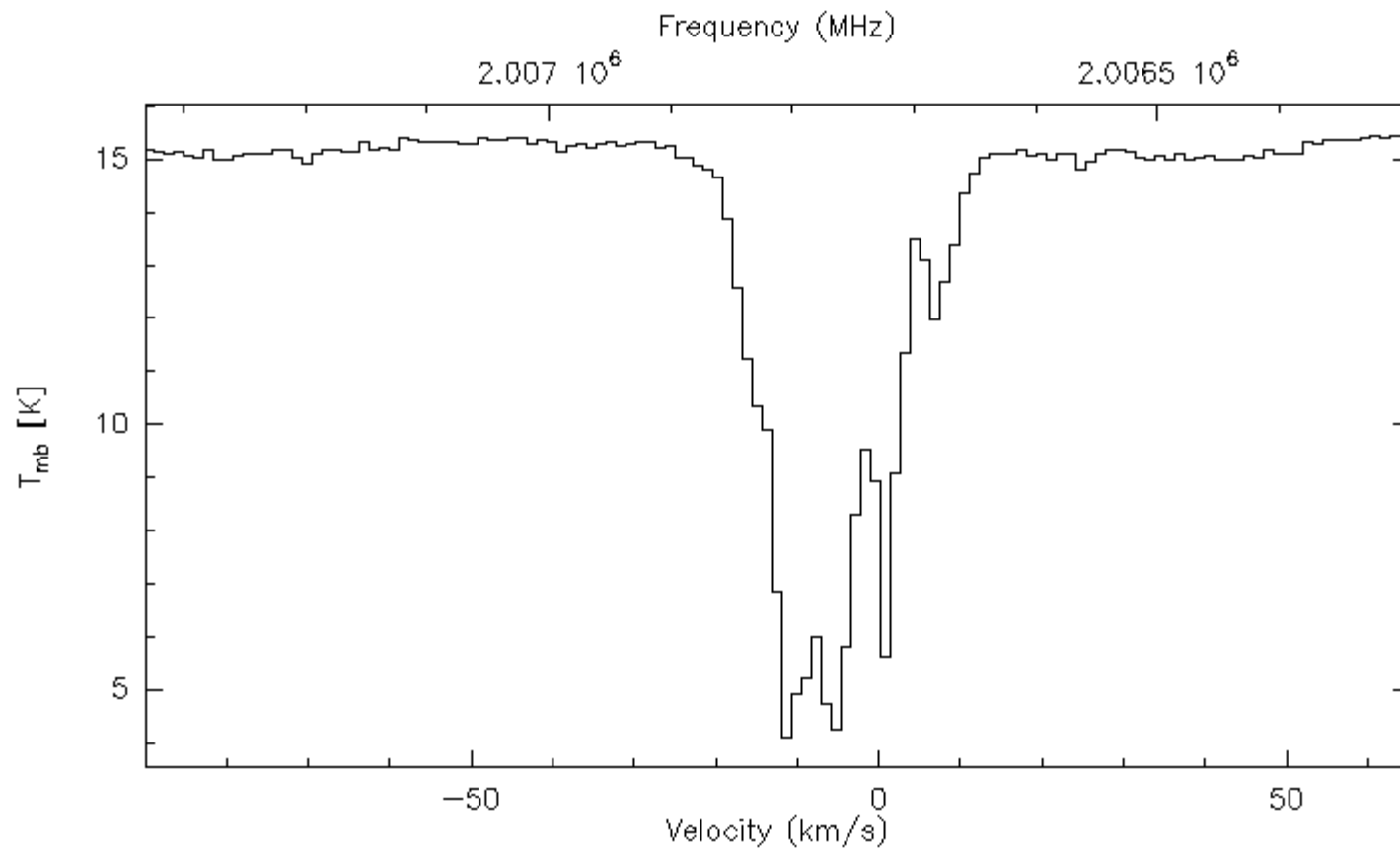
O;O NGC6334 I SH U SOF-4G3 O S 0:27-JUL-2021 R:27-OCT-2021  
RA: 17:20:53.35 DEC: -35:47:01.5 Eq 2000.0 Rad. 0.0° Offs: +0.6 +1.2  
Excellent tau: 0.038 Tsys: 4232. Time: 36.7min El: 34.8  
N: 736 l0: 262.081 V0: -5.000 Dv: -1.217 LSR  
F0: 1383250.00 Df: 5.616 Fi: 1380449.95



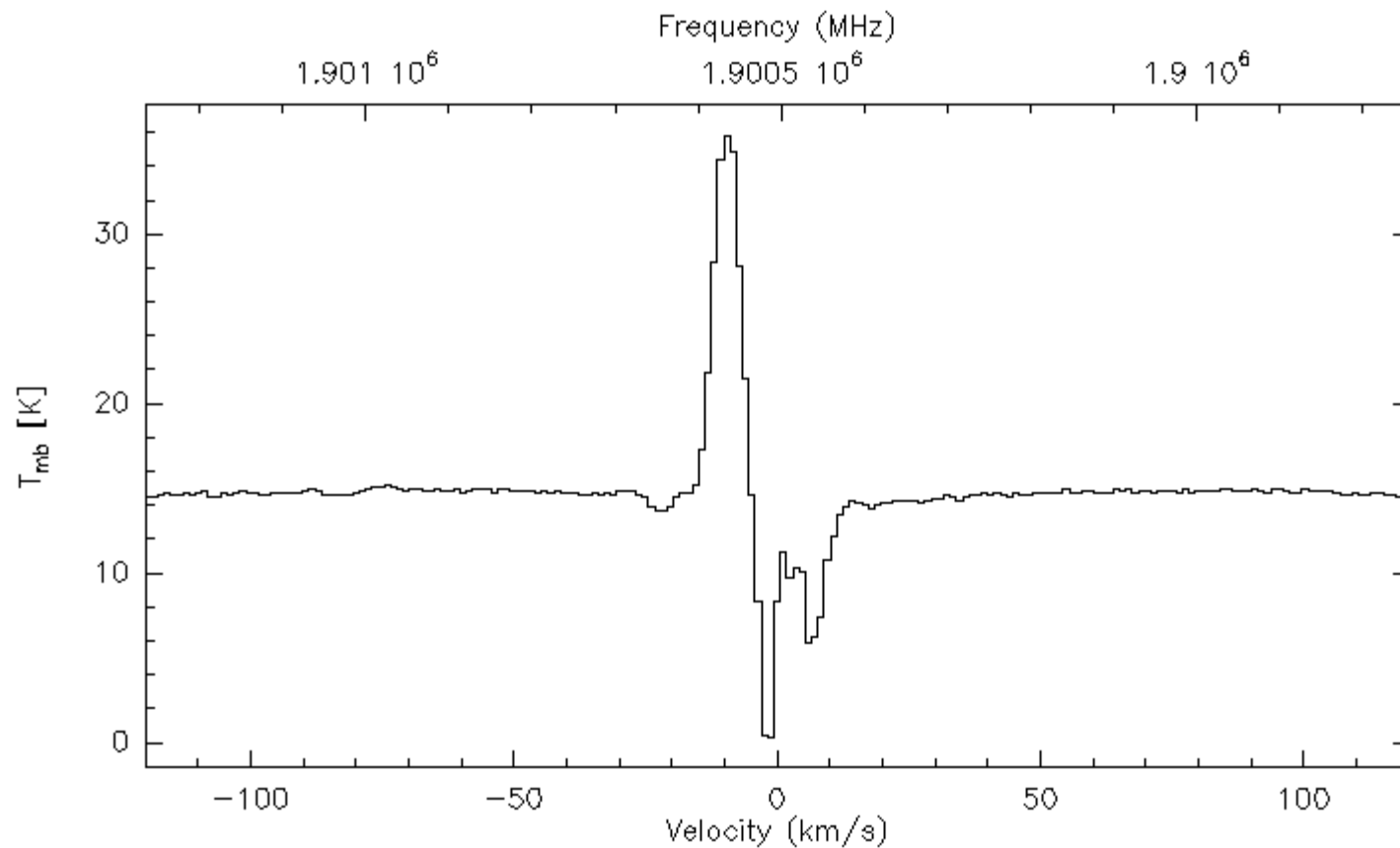
0;0 NGC6334 I OH 2PI32 HU SOF-4G4 O S 0:27-JUL-2021 R:27-OCT-2021  
RA: 17:20:53.35 DEC: -35:47:01.5 Eq 2000.0 Rad. 0.0° Offs: +0.0 +0.0  
Excellent tau: 0.051 Tsys: 22616. Time: 36.7min El: 34.8  
N: 424 l0: 162.884 V0: -5.000 Dv: -1.194 LSR  
F0: 2514316.71 Df: 10.01 Fi: 2511316.65



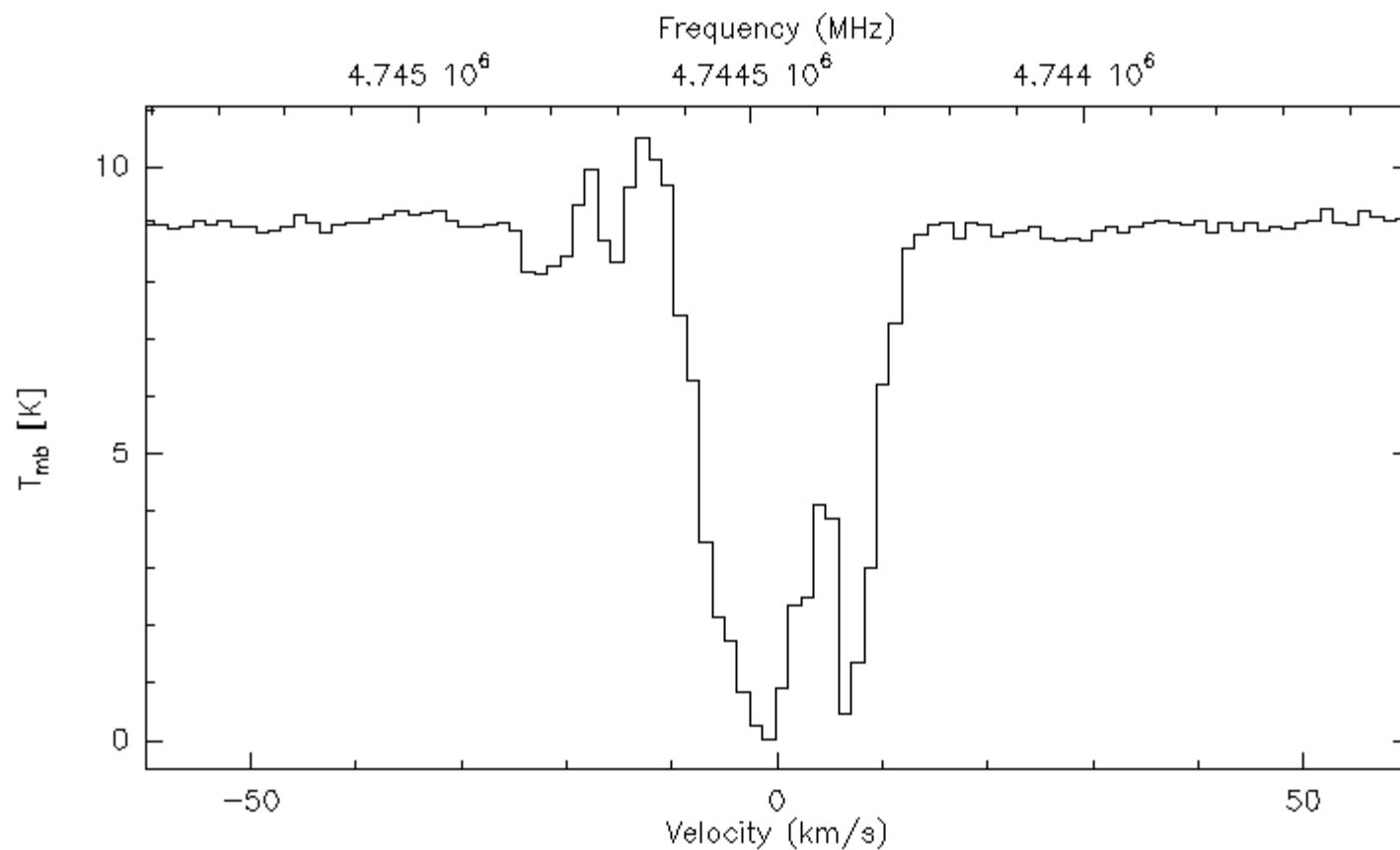
0;0 NGC6334 I CH 149 U SOF-LFA- 0 S 0:08-AUG-2021 R:27-OCT-2021  
RA: 17:20:53.35 DEC: -35:47:01.5 Eq 2000.0 Rad. 0.0° Offs: +1.4 +0.2  
Good tau: 0.146 Tsys: 3342. Time: 21.1min El: 33.1  
N: 496 l0: 161.812 V0: -5.000 Dv: -1.204 LSR  
FO: 2006762.58 Df: 8.057 Fi: 2004162.49



O;0 NGC6334 I CII U SOF-LFA- 0 S 0:08-AUG-2021 R:27-OCT-2021  
RA: 17:20:53.35 DEC: -35:47:01.5 Eq 2000.0 Rad. 0.0° Offs: +1.4 +0.2  
Good tau: 0.251 Tsys: 3522. Time: 23.9min El: 25.1  
N: 528 l0: 172.219 V0: -5.000 Dv: -1.194 LSR  
FO: 1900536.90 Df: 7.568 Fi: 1897936.81

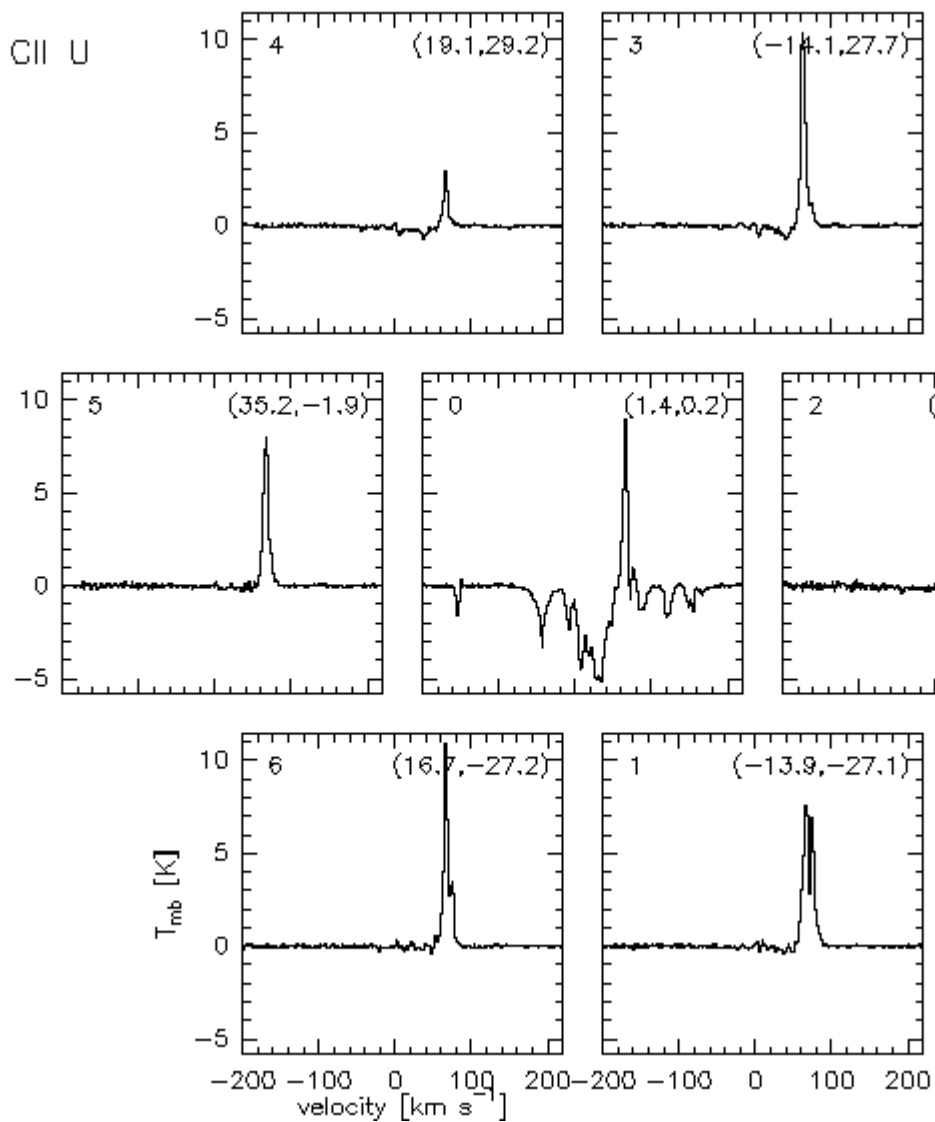


0;0 NGC6334I M15 OI 63 L SOF-HFAV 0 S 0:08-AUG-2021 R:27-OCT-2021  
RA: 17:20:53.35 DEC: -35:47:01.5 Eq 2000.0 Rad. 0.0° Offs: +0.1 -0.5  
Fair tau: 0.464 Tsys: 5368. Time: 39.9min El: 31.1  
N: 236 I0: 68.0002 V0: -20.00 Dv: 1.203 LSR  
F0: 4744777.49 Df: -19.04 Ff: 4747348.92

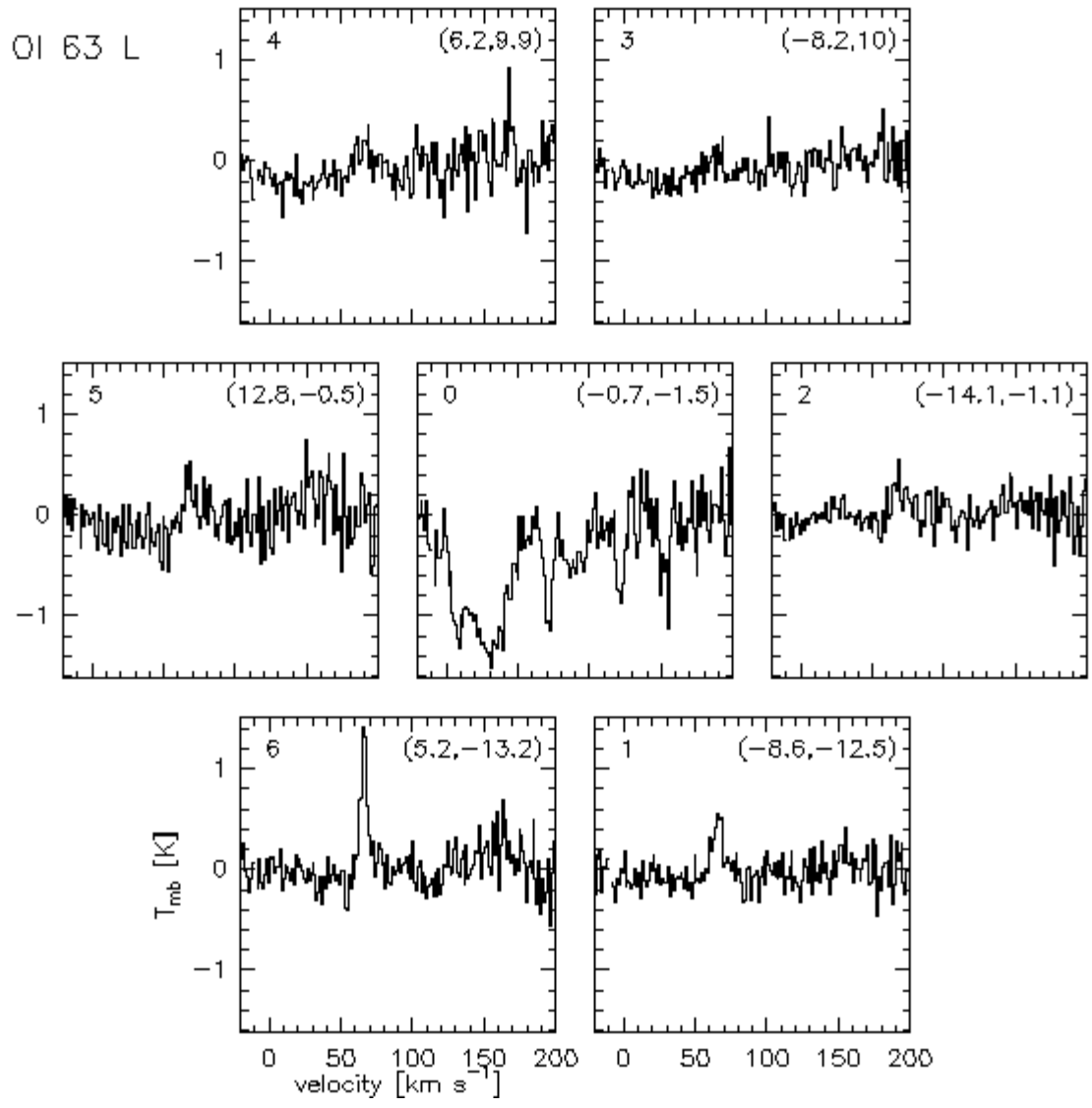


Array footprints for individual targets (CH and CII in LFA, OI 63 $\mu$ m in HFA) w/o continuum. For details, see data reduction letter.

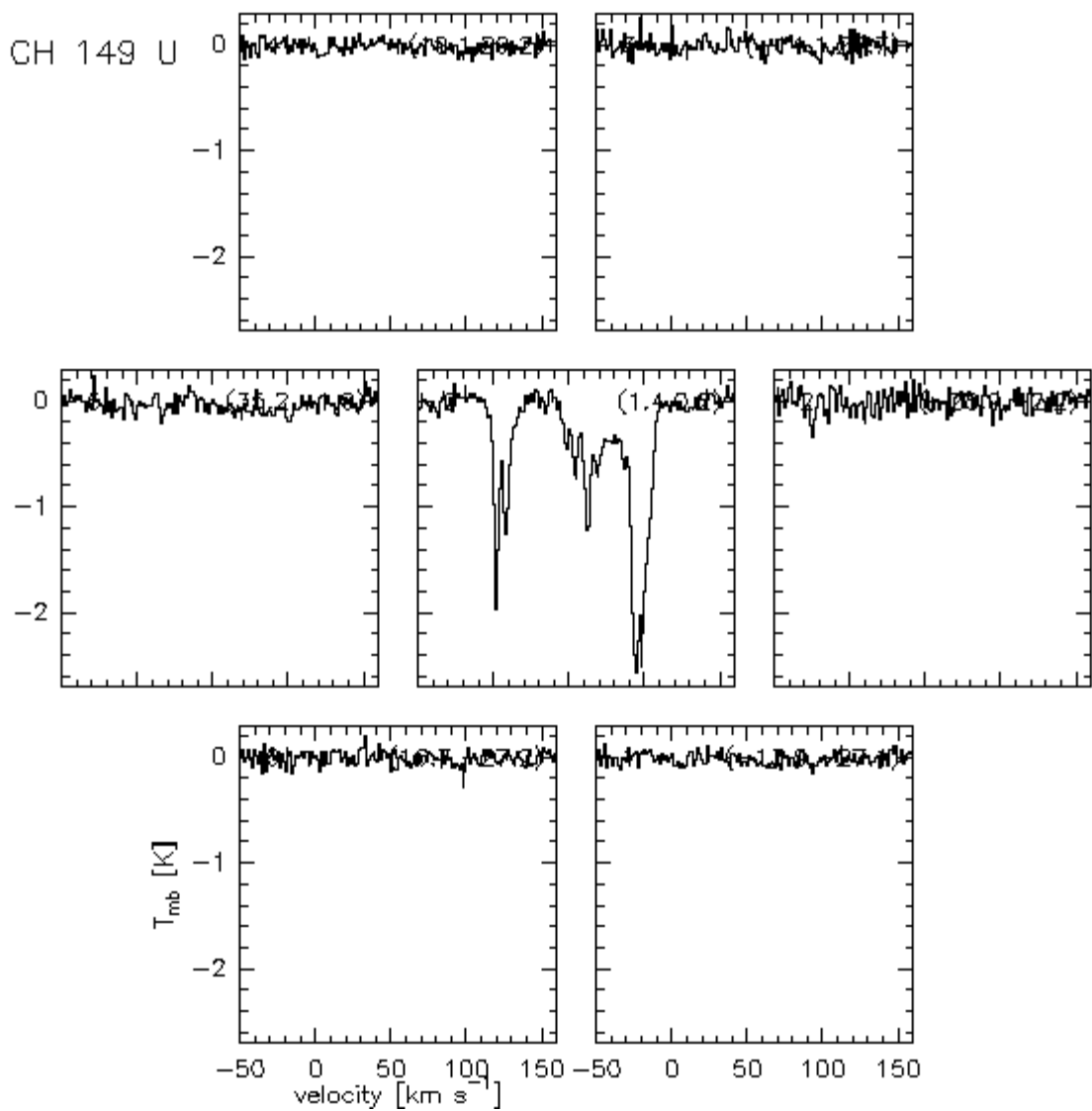
G10P47+0P03, CII U



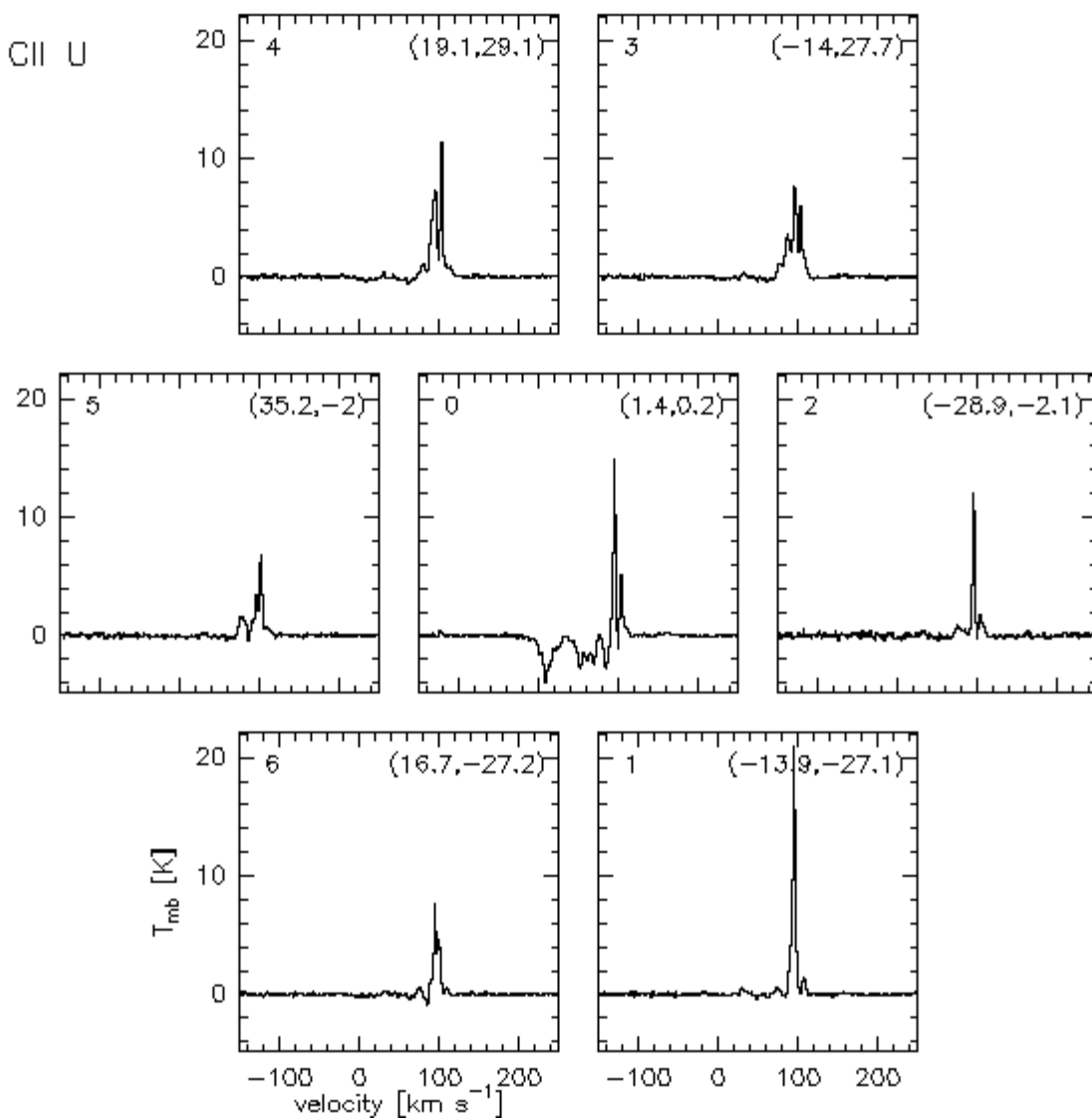
G10P47+0P03, OI 63 L



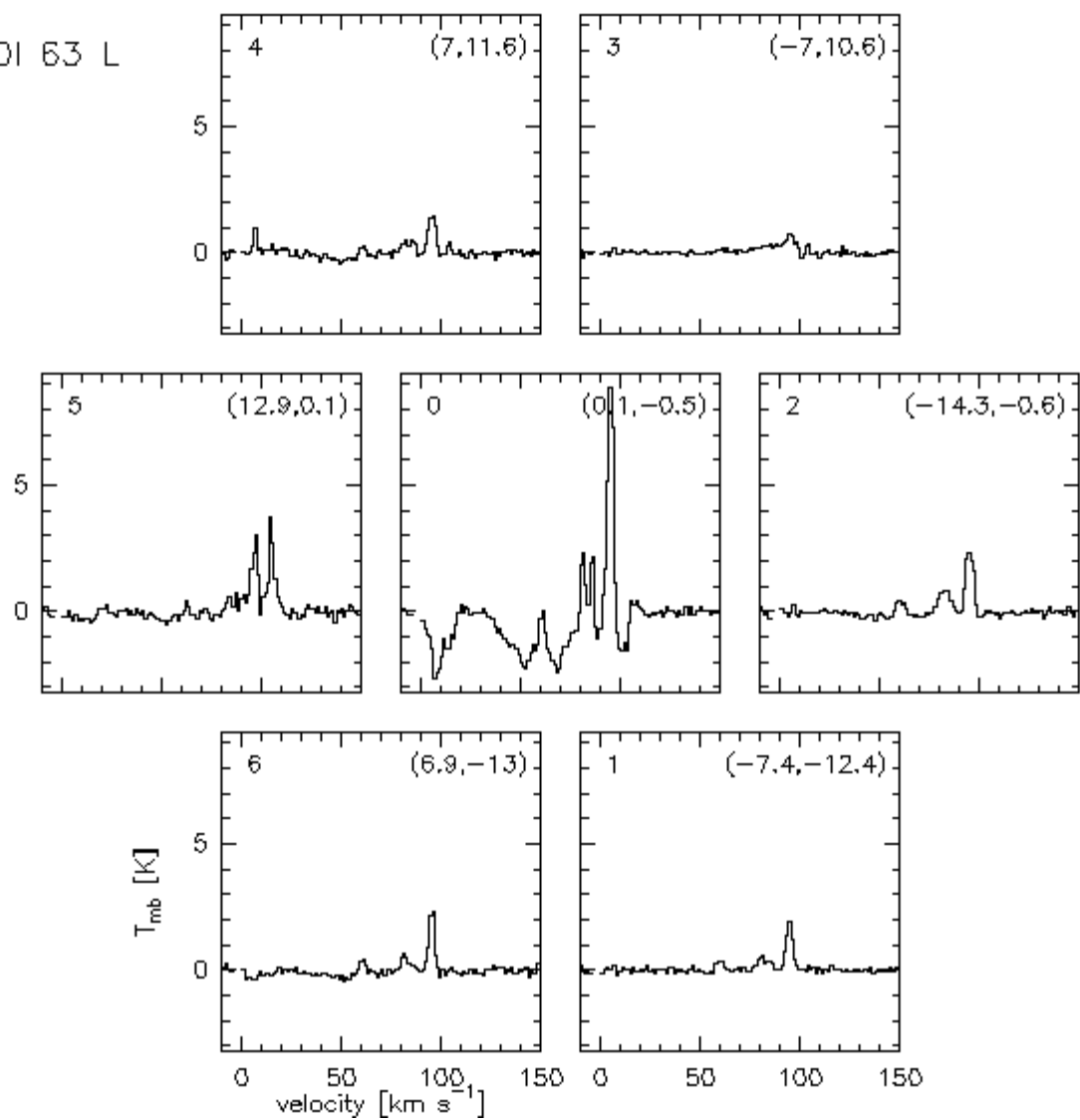
G29P96-0P02, CH 149 U



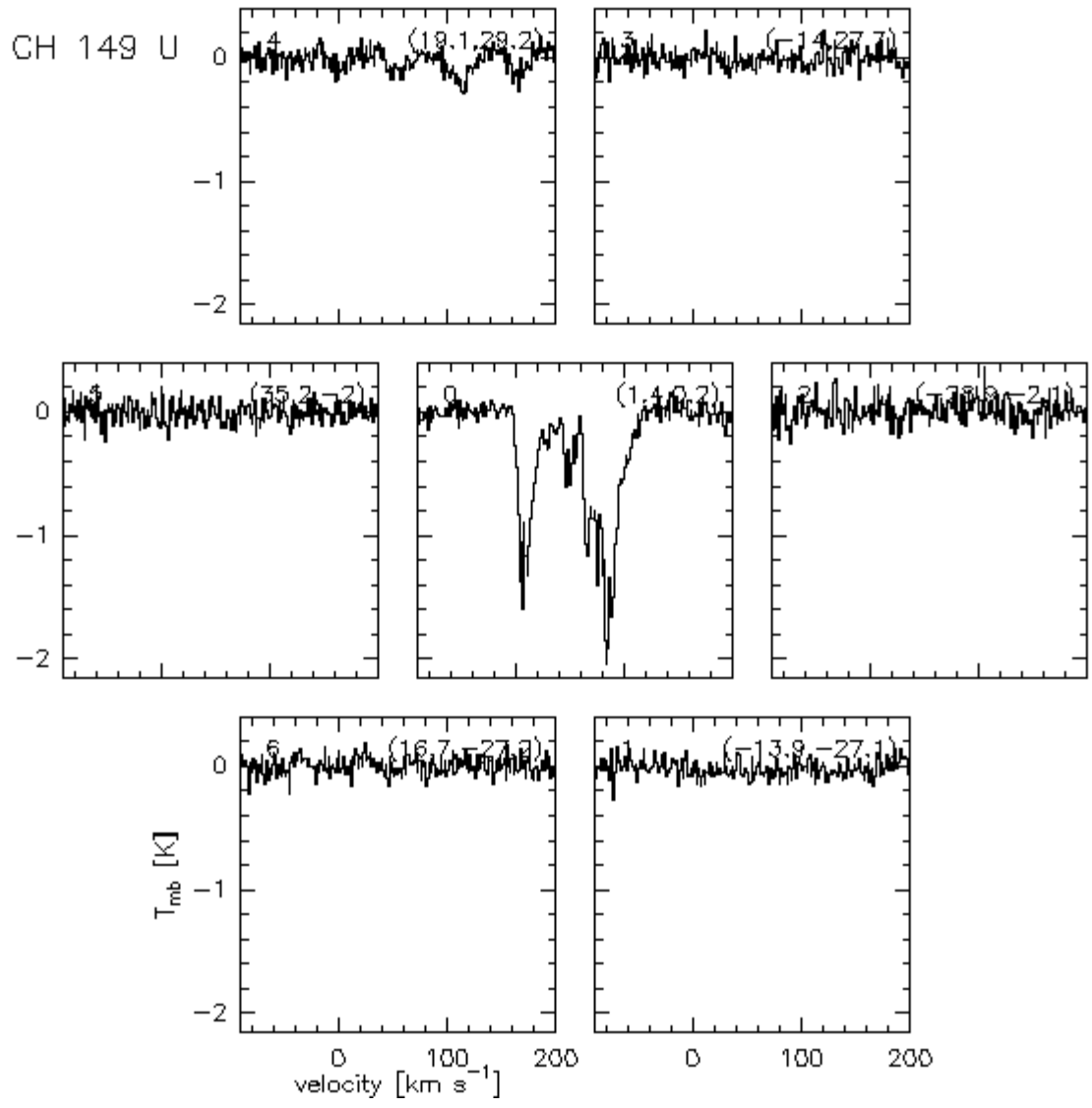
G29P96-0P02, CII U



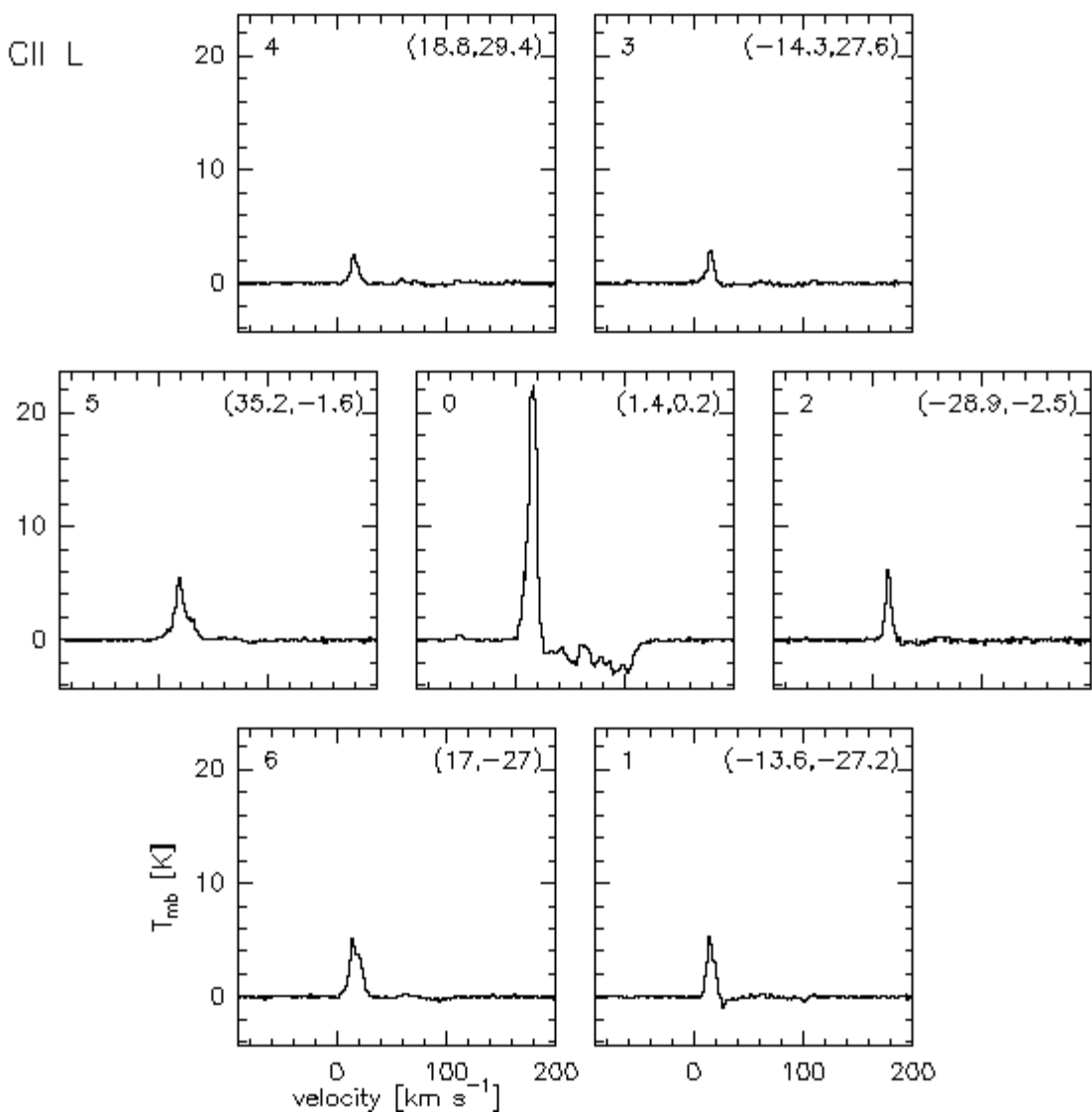
G29P96-0P02, OI 63 L



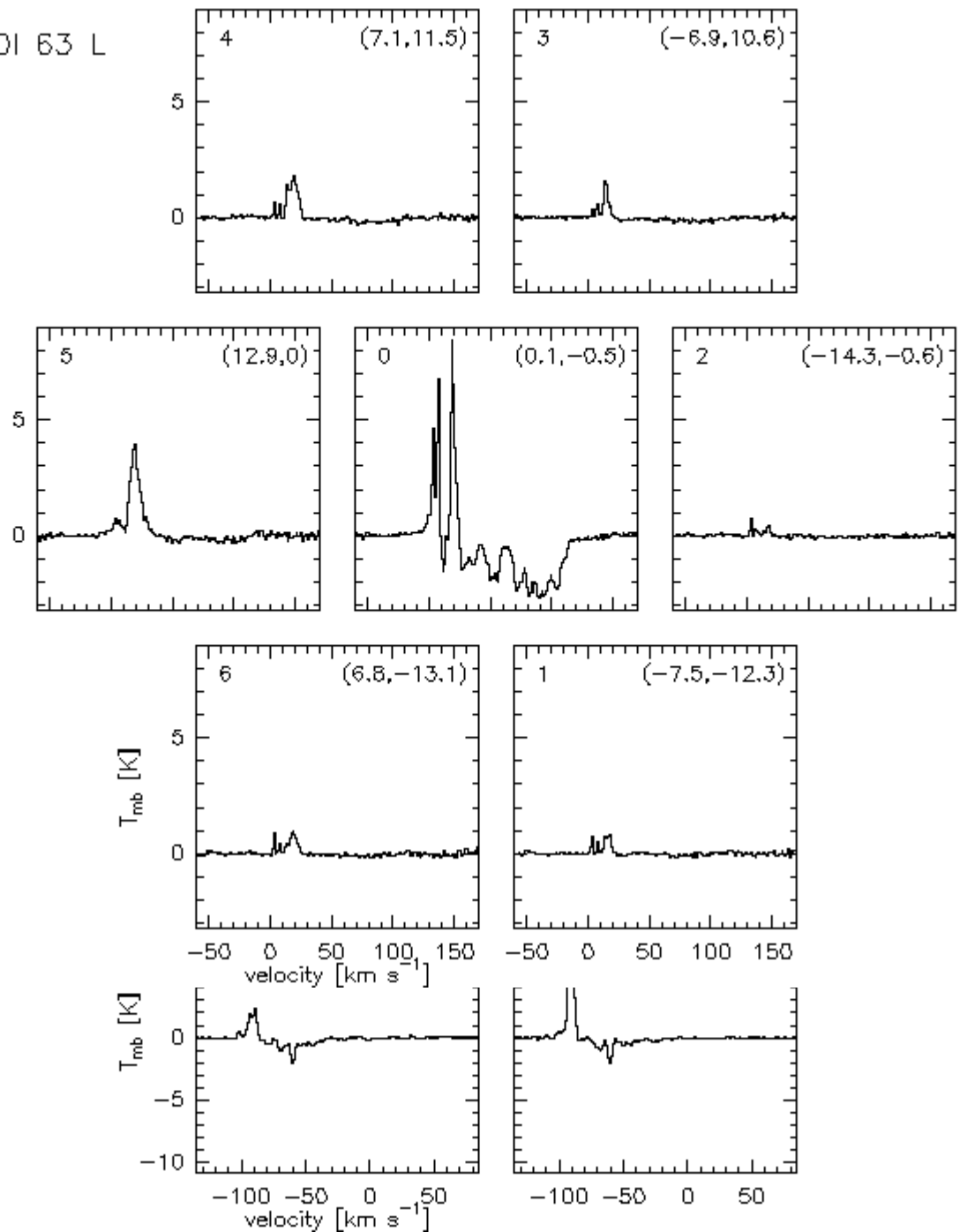
G32P80+0P19, CH 149 U



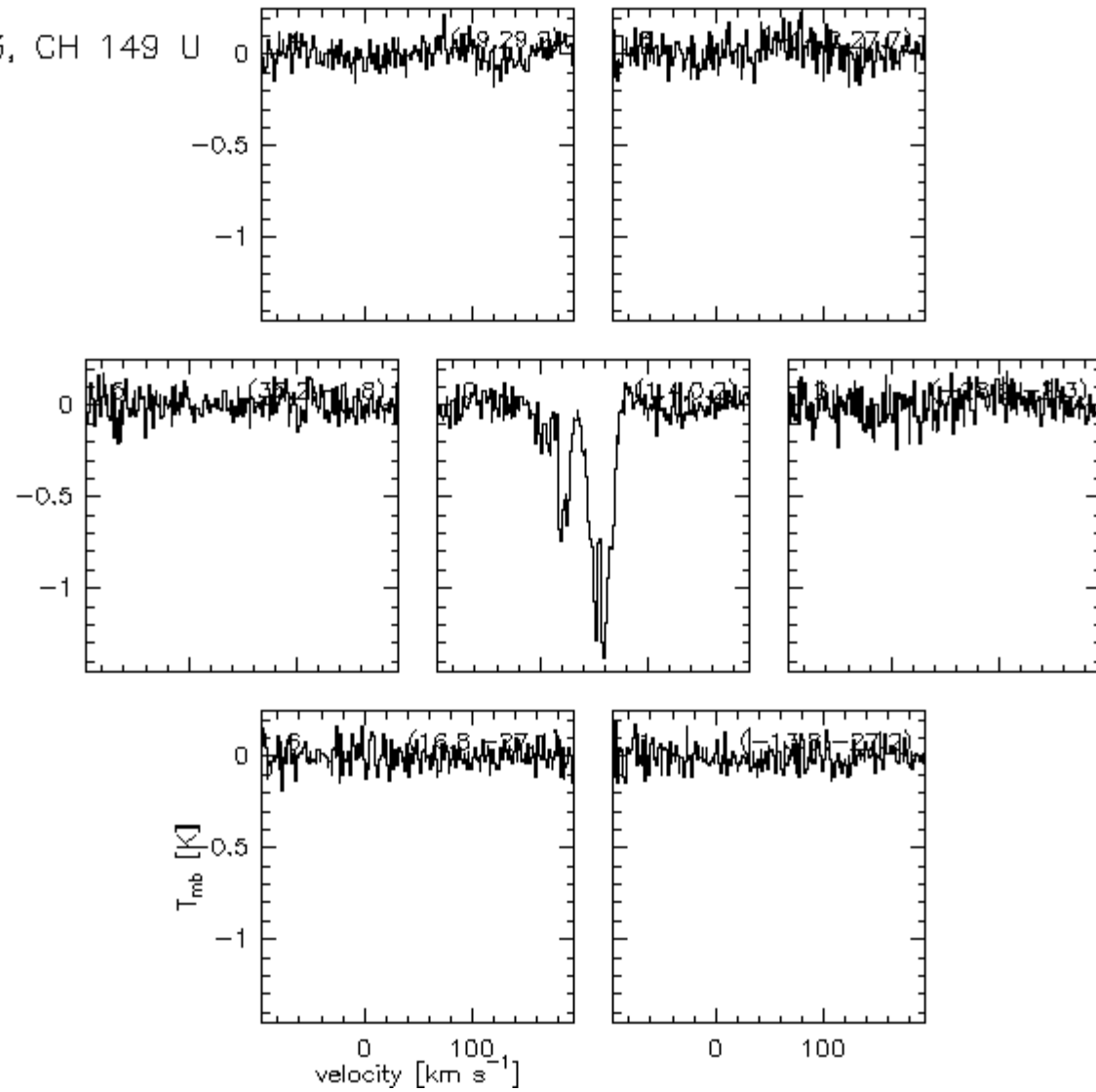
G32P80+0P19, CII L



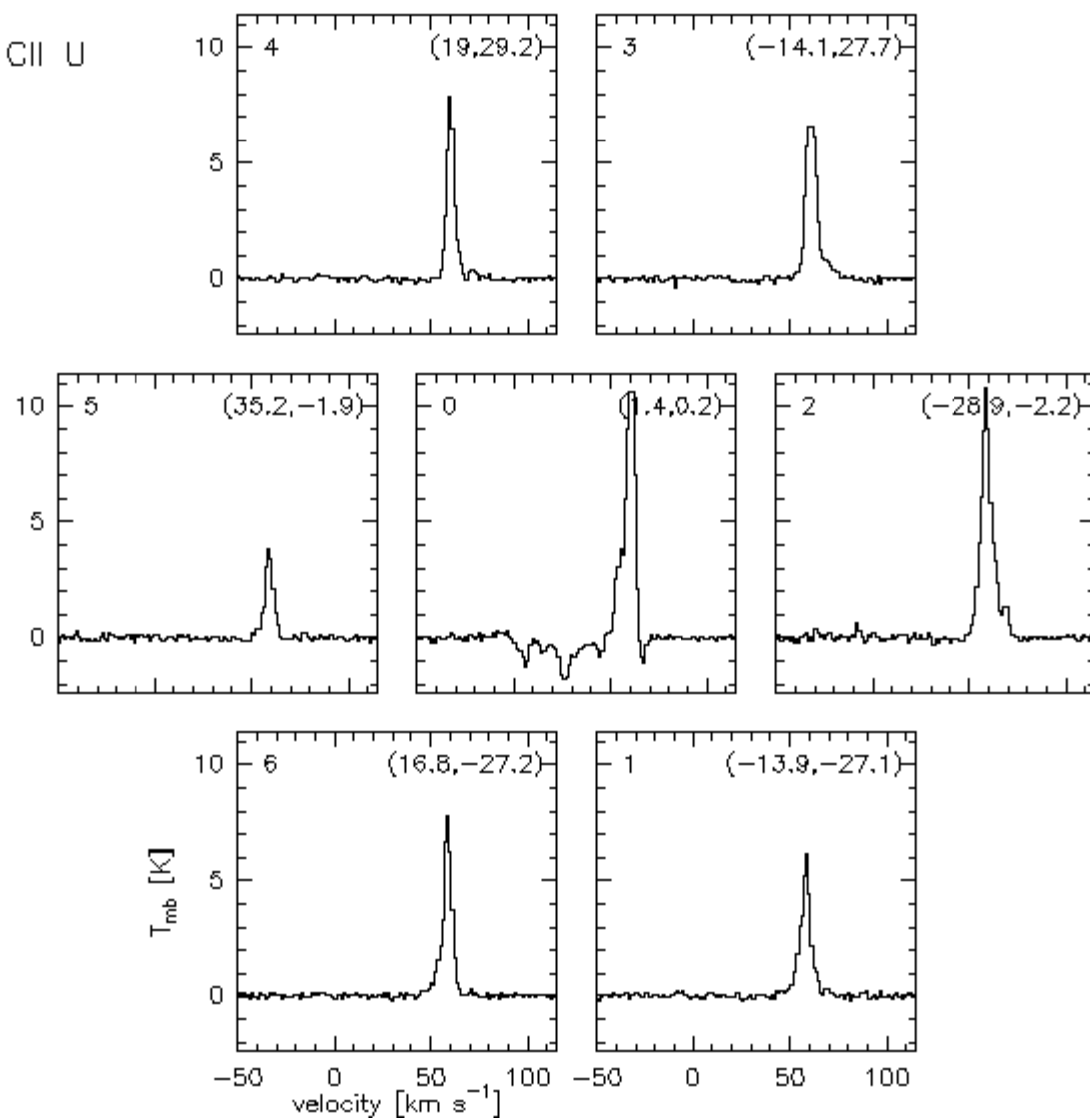
G32P80+0P19, OI 63 L



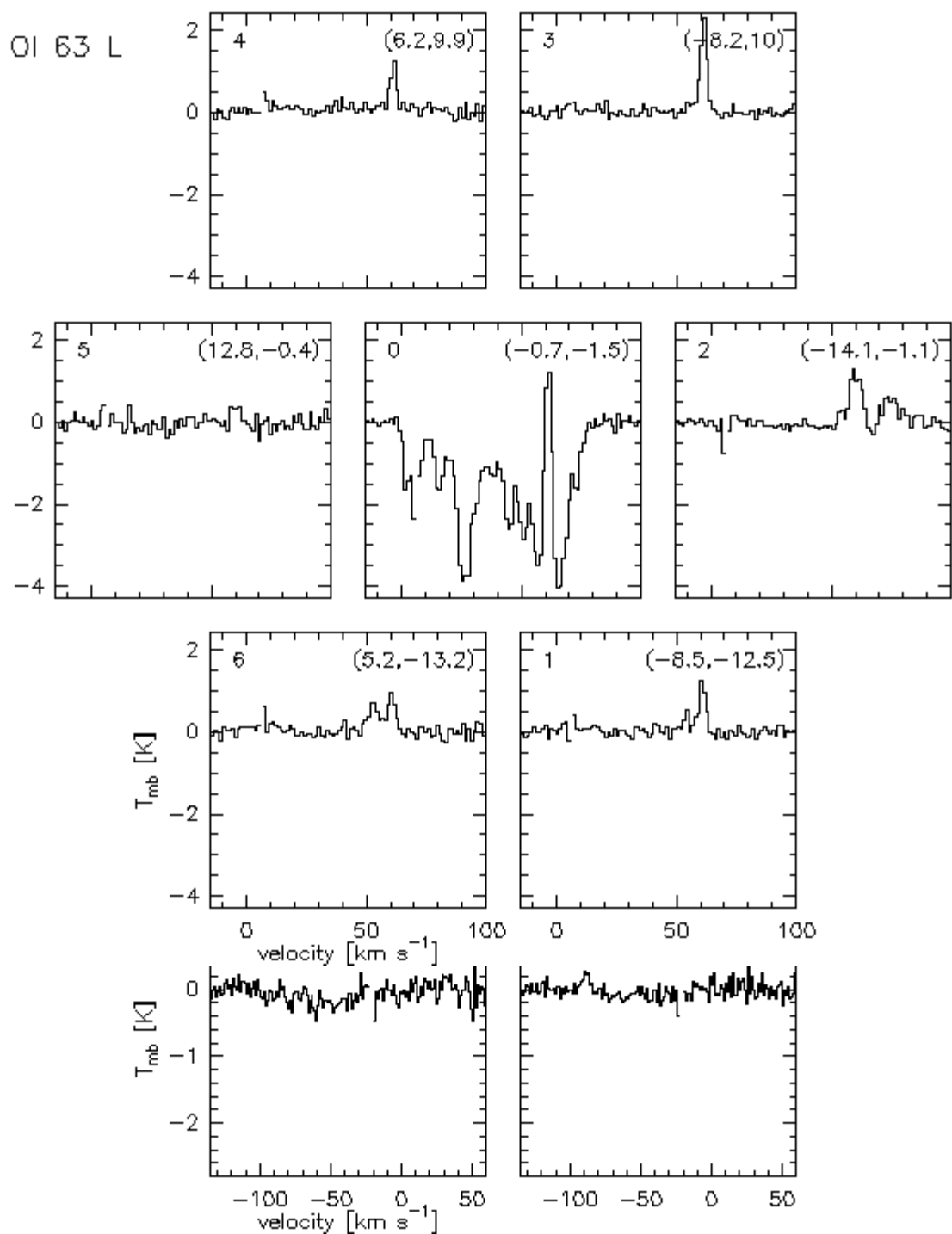
G45P07+0P13, CH 149 U



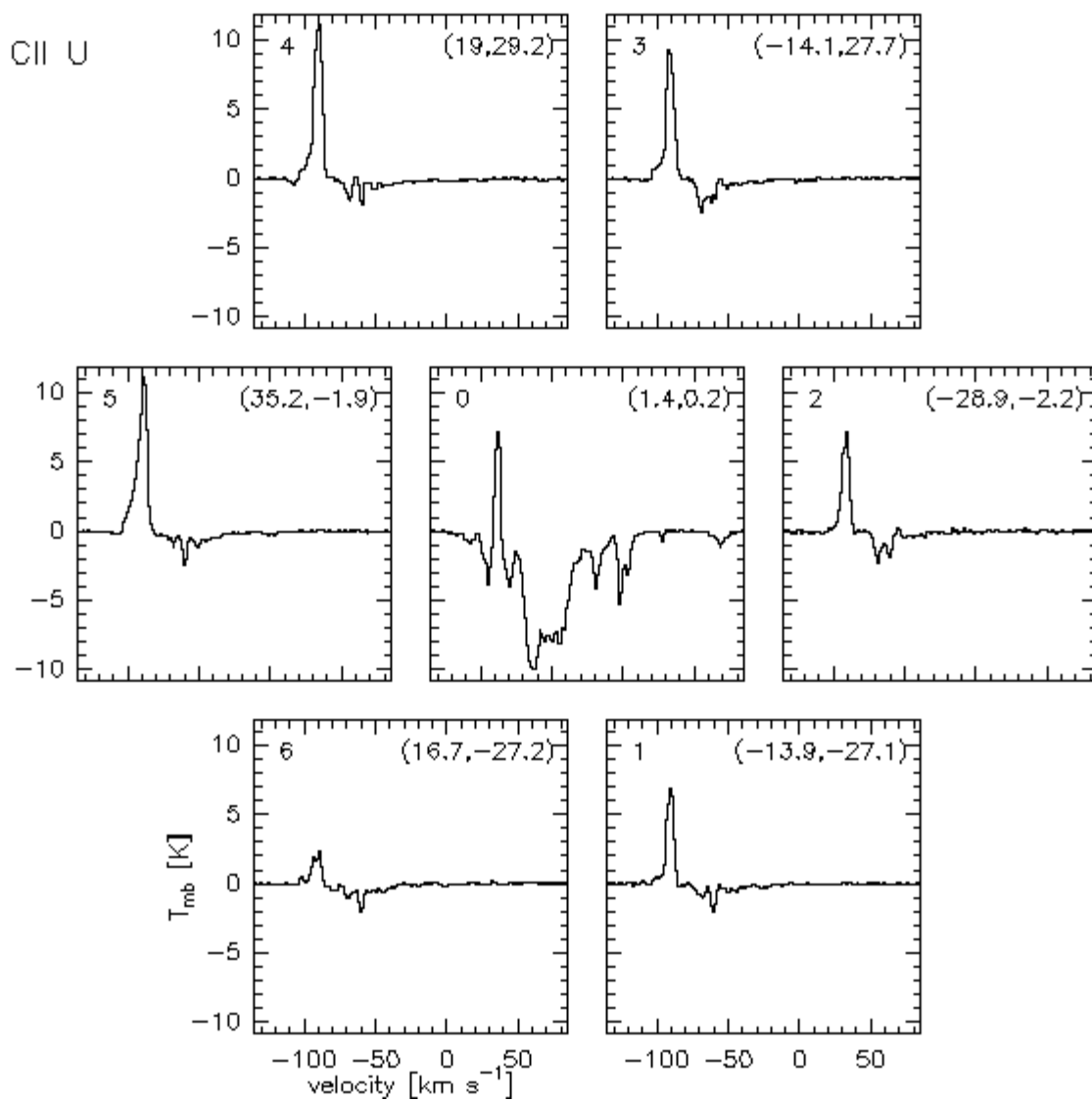
G45P07+0P13, CII U



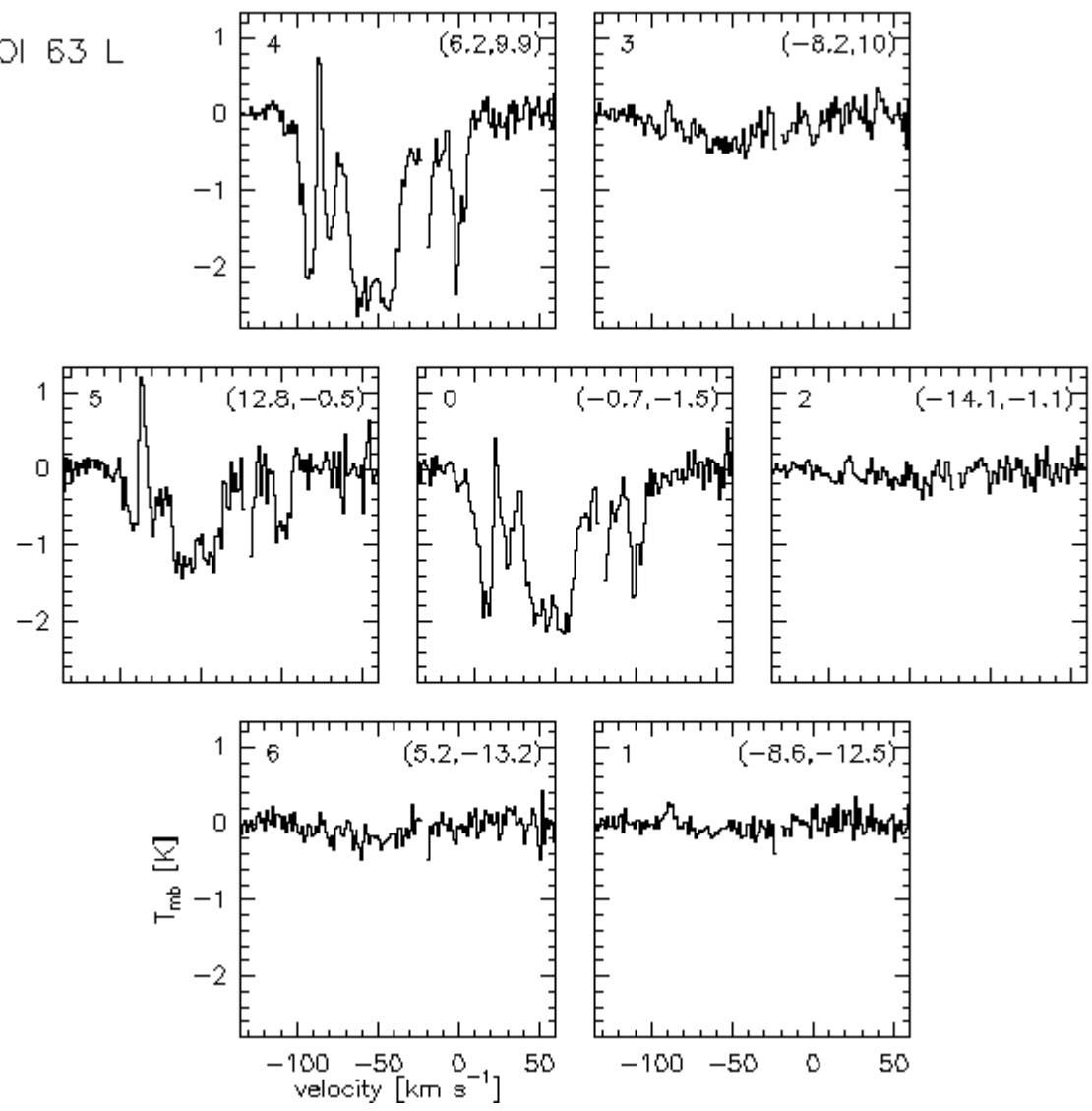
G45P07+0P13, OI 63 L



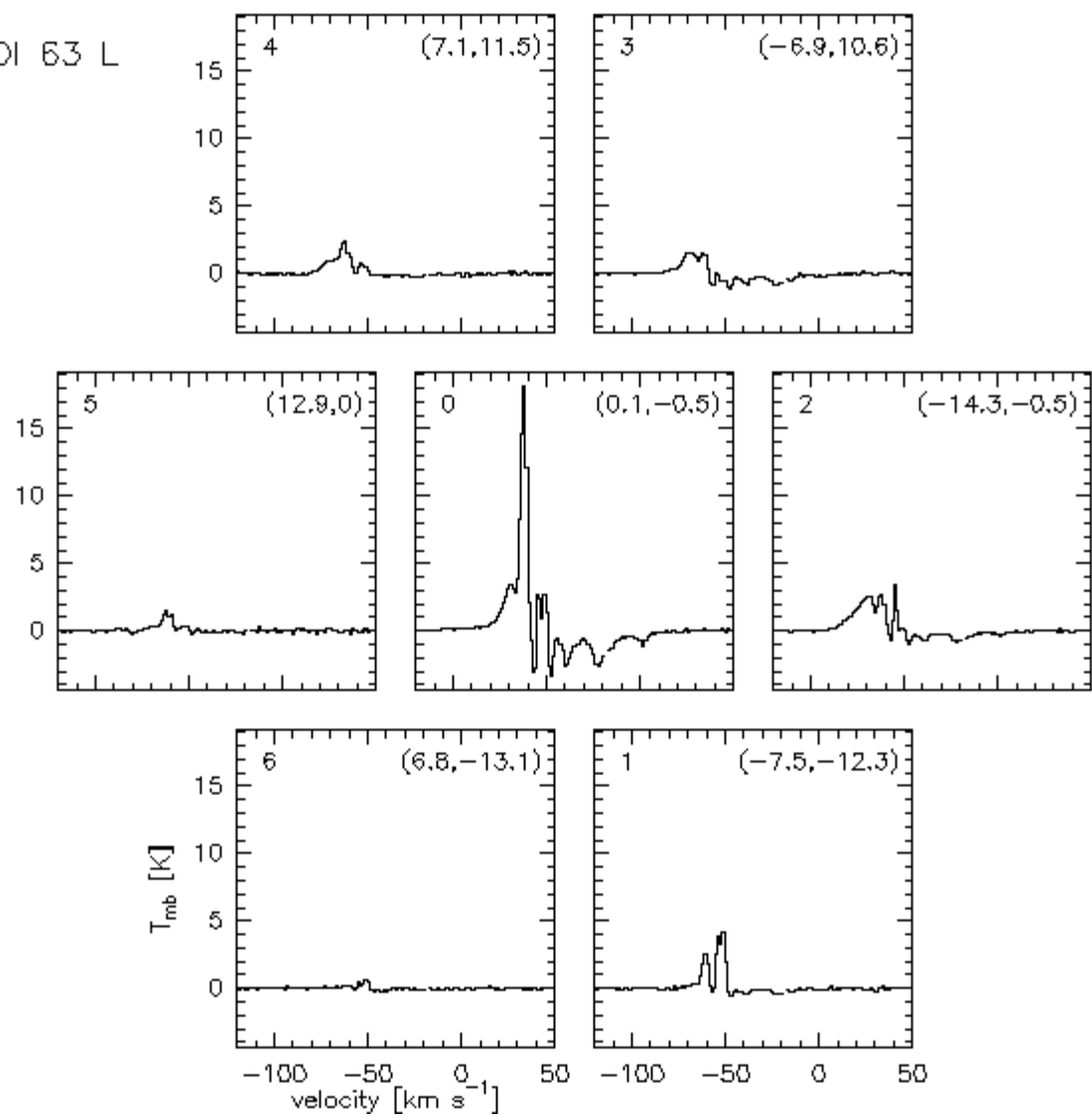
116060-5146, CII U



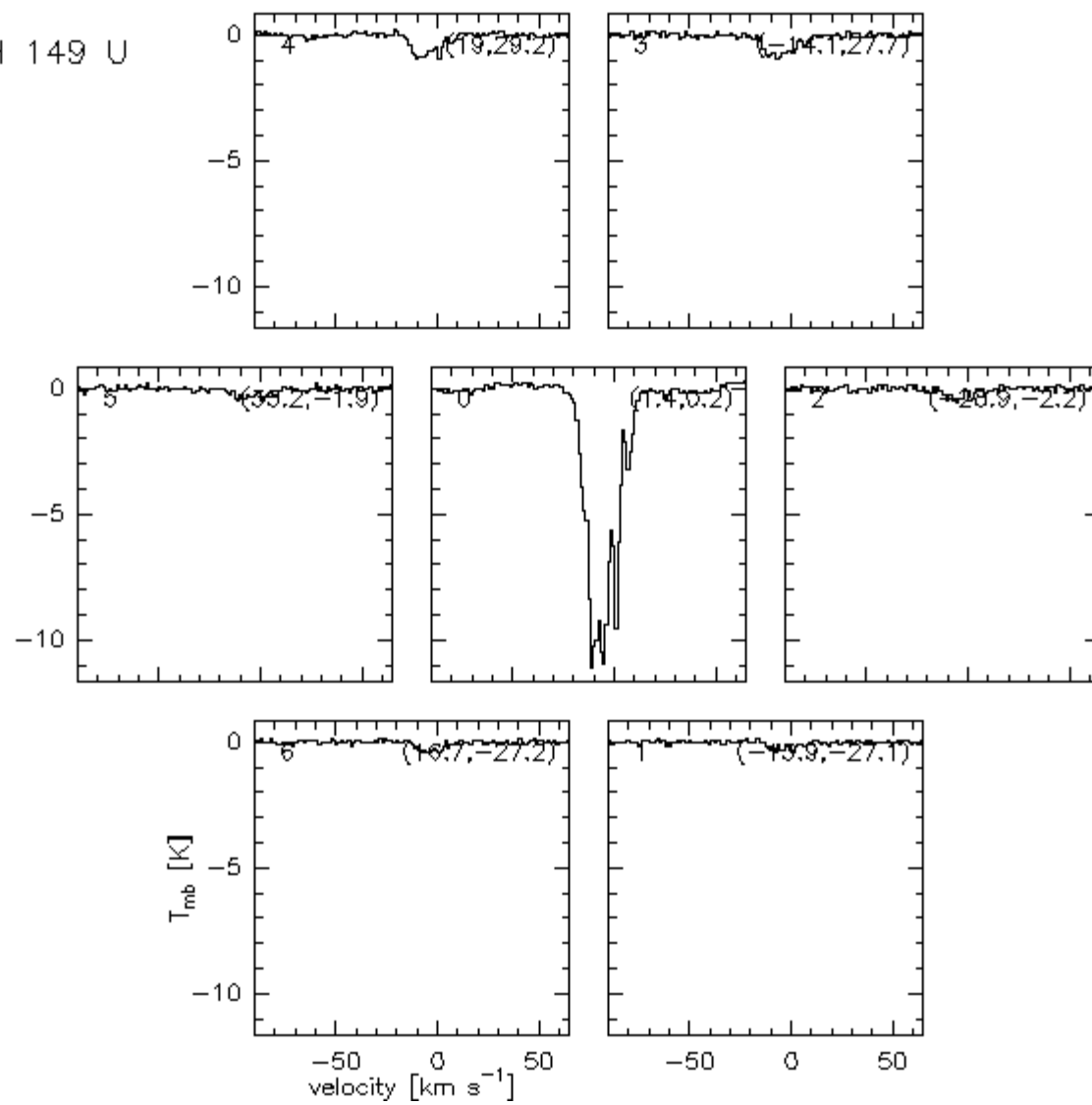
116060-5146, OI 63 L



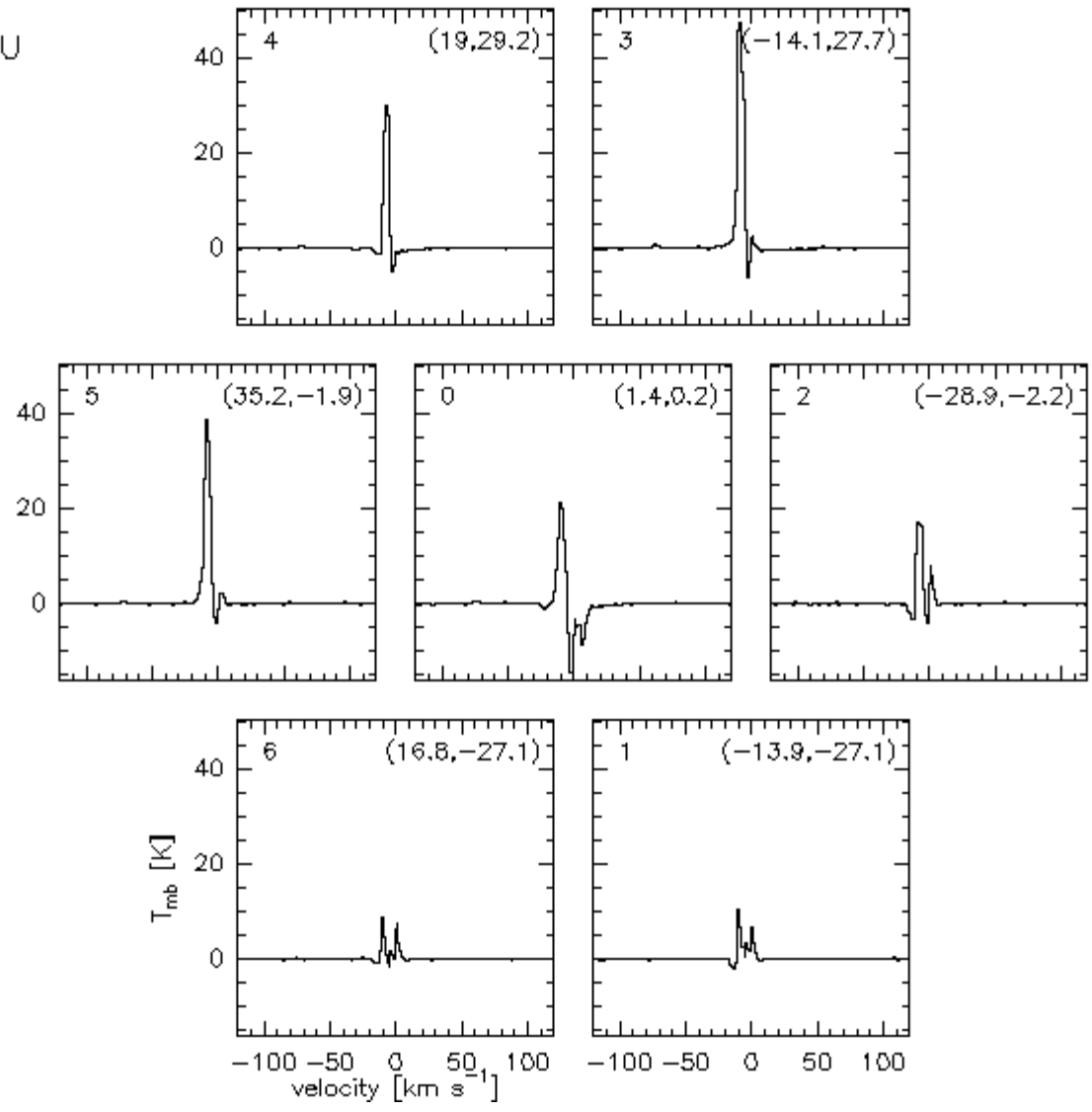
116164-5046, OI 63 L



NGC6334 I, CH 149 U



NGC6334 I, CII U



NGC6334I M15, OI 63 L

