

Southern Surveys of Hot Cores

Andrew Walsh (James Cook University)

With thanks to...

Michael Burton (UNSW), Sven Thorwirth (MPIfR), Henrik Beuther (MPIA), Jackie Chapman (Macquarie), Mark Wardle (Macquarie), Tom Millar (QUB), Nadia Lo (UNSW), Steven Longmore (UNSW) and Graeme White (JCU)

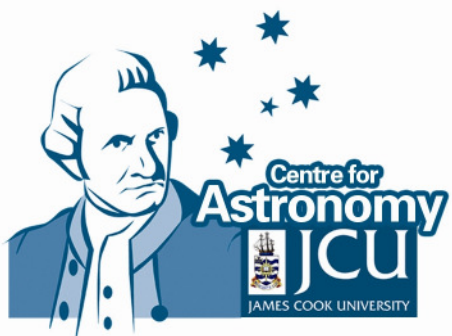
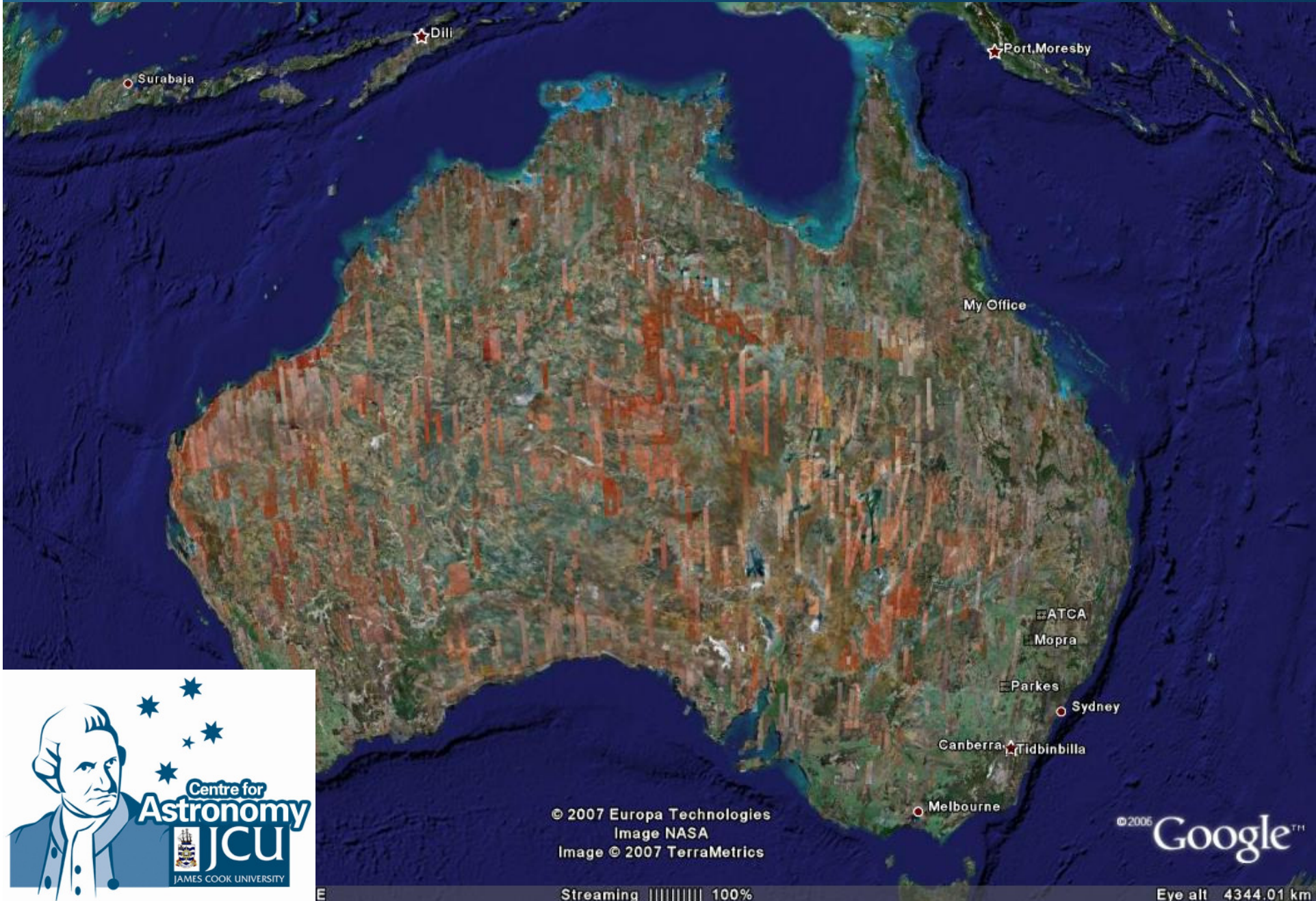


Image Courtesy: Cormac Purcell



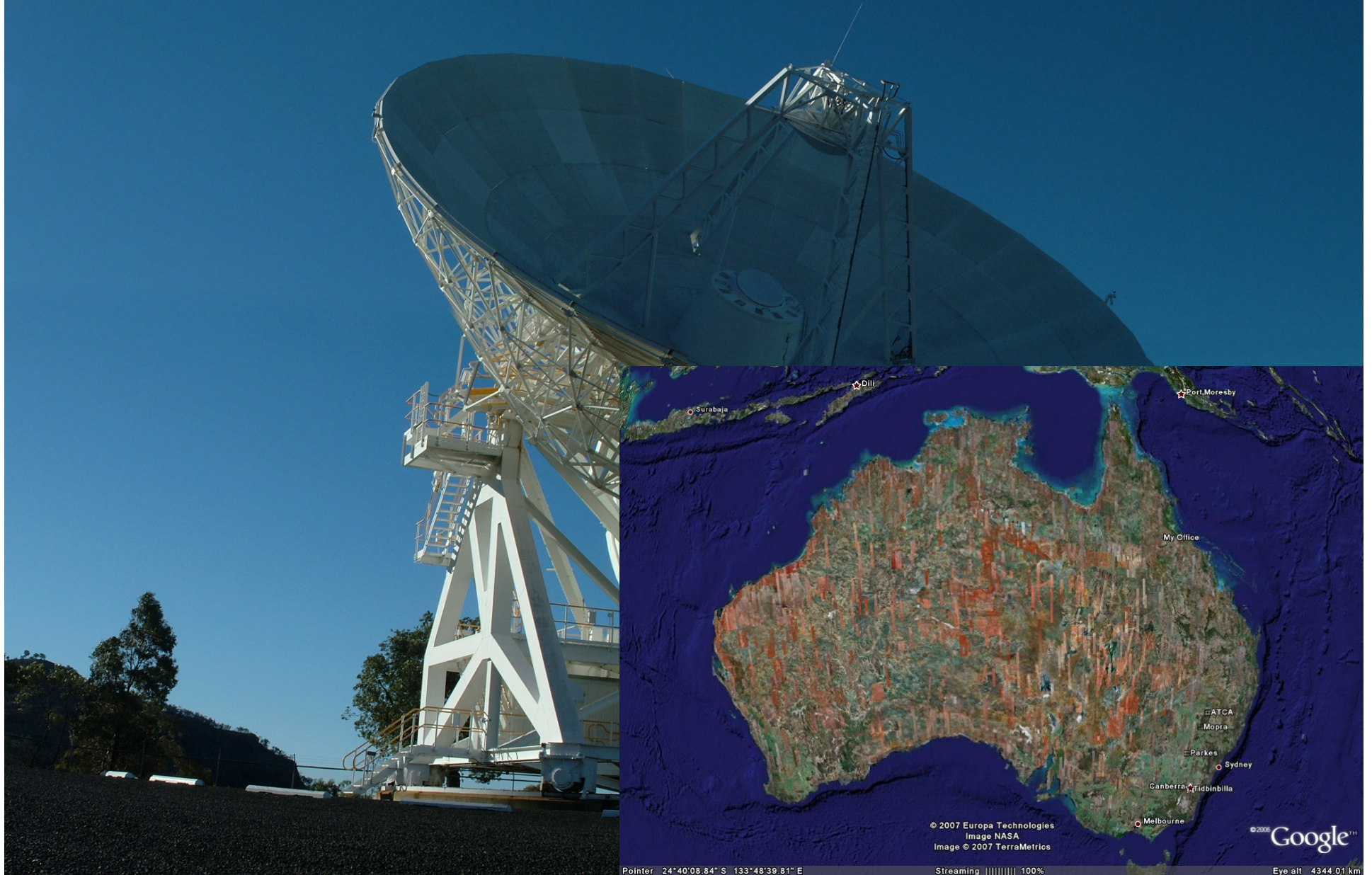
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Streaming ||||| 100%

Eye alt 4344.01 km

The Mopra Radiotelescope



Recent Mopra Upgrades



- On-the-fly mapping to quickly scan the sky
- New 3mm receiver covers 77-116GHz
- New 12mm receiver covers 16-28GHz
- The new spectrometer (MOPS) has instantaneous 8GHz bandwidth with up to 32,000 channels (2 polarisations) 0.25MHz per channel in broadband mode

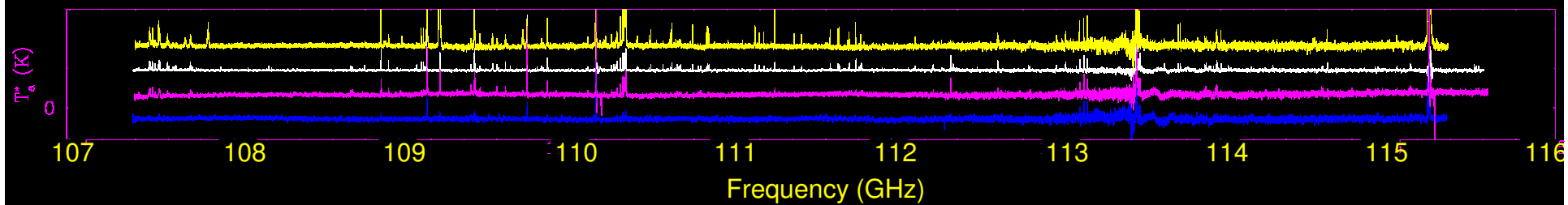
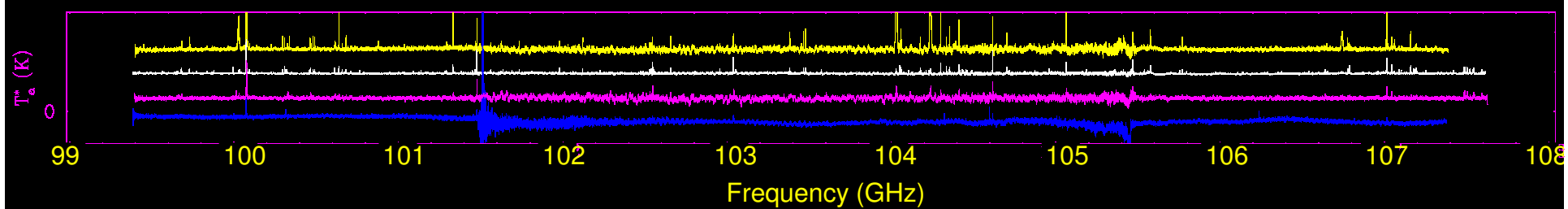
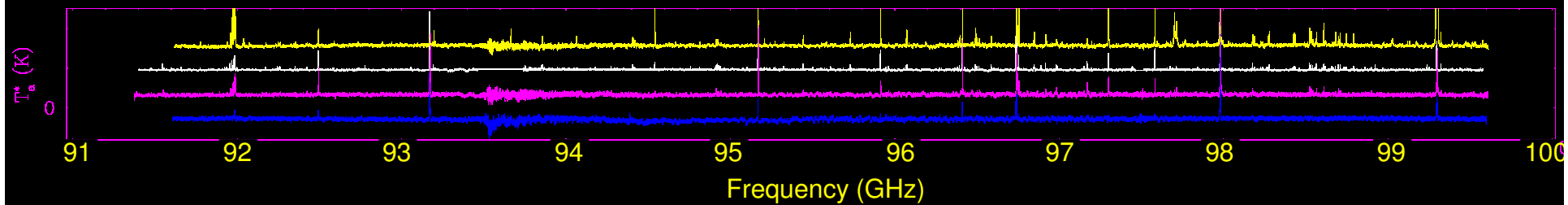
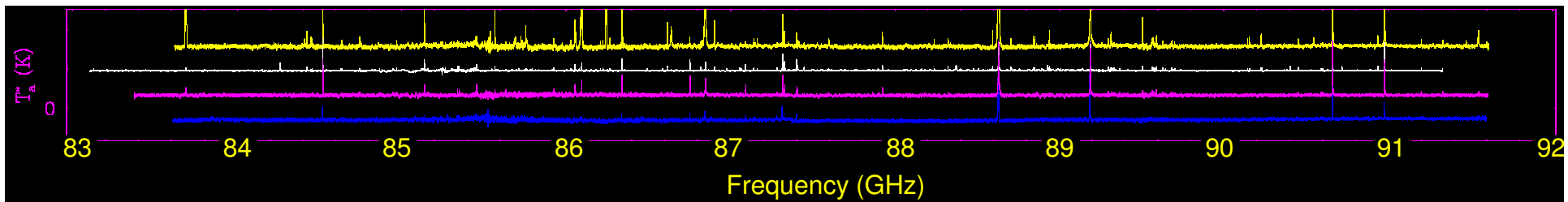
Surveys with Mopra



1. Line Surveys of Many Sources
2. Line Survey Maps
3. Mapping Many Spectral Lines on a Galaxy-wide Scale

A large radio telescope dish is shown at night, illuminated from below, creating a dramatic silhouette against a dark blue sky. The dish is supported by a complex metal structure. The text "Line surveys of many sources" is overlaid in white, centered on the image.

Line surveys of many sources

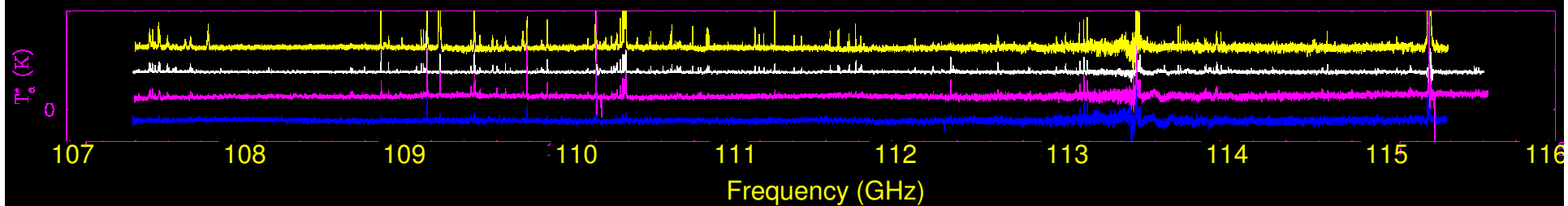
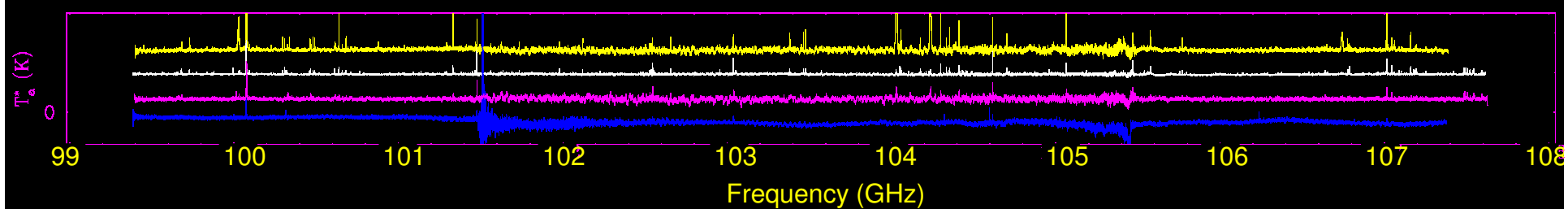
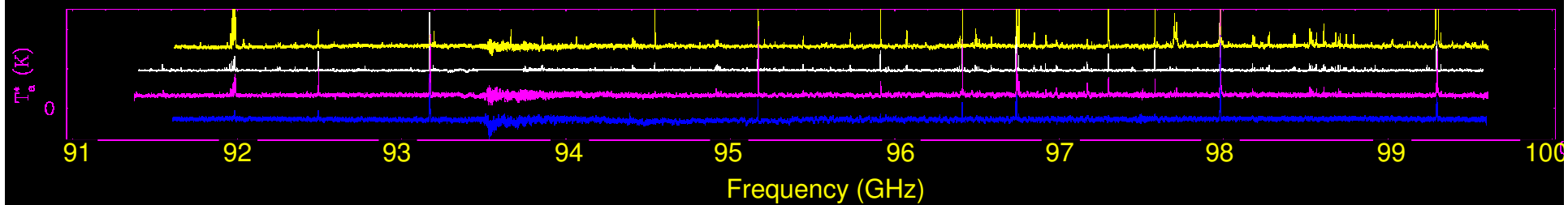
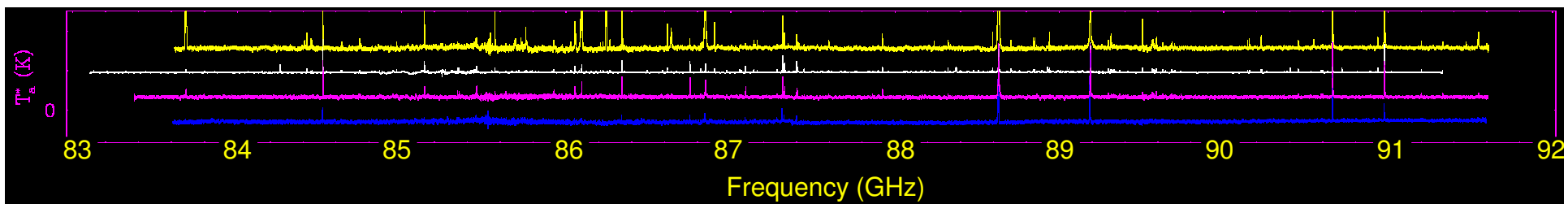


Orion

G327.3-0.6

17233-3606

G305.2+0.2

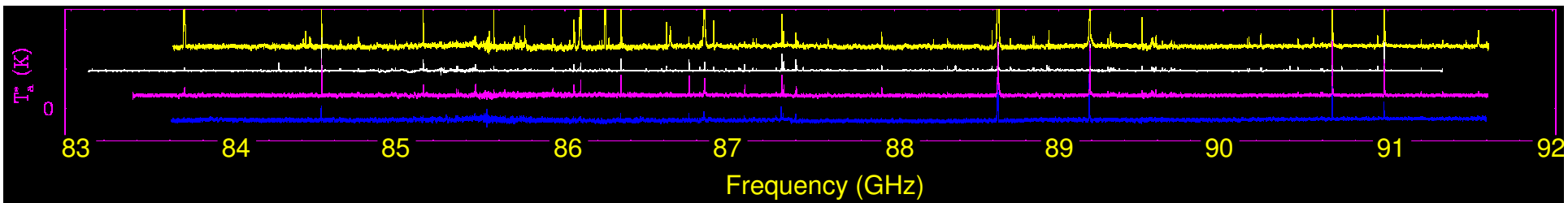


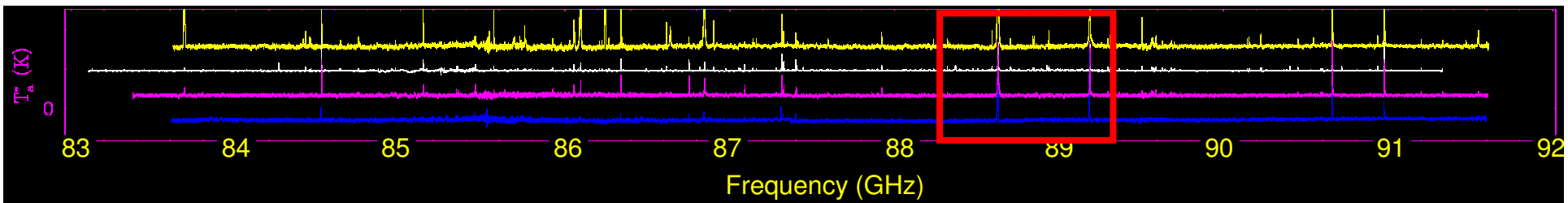
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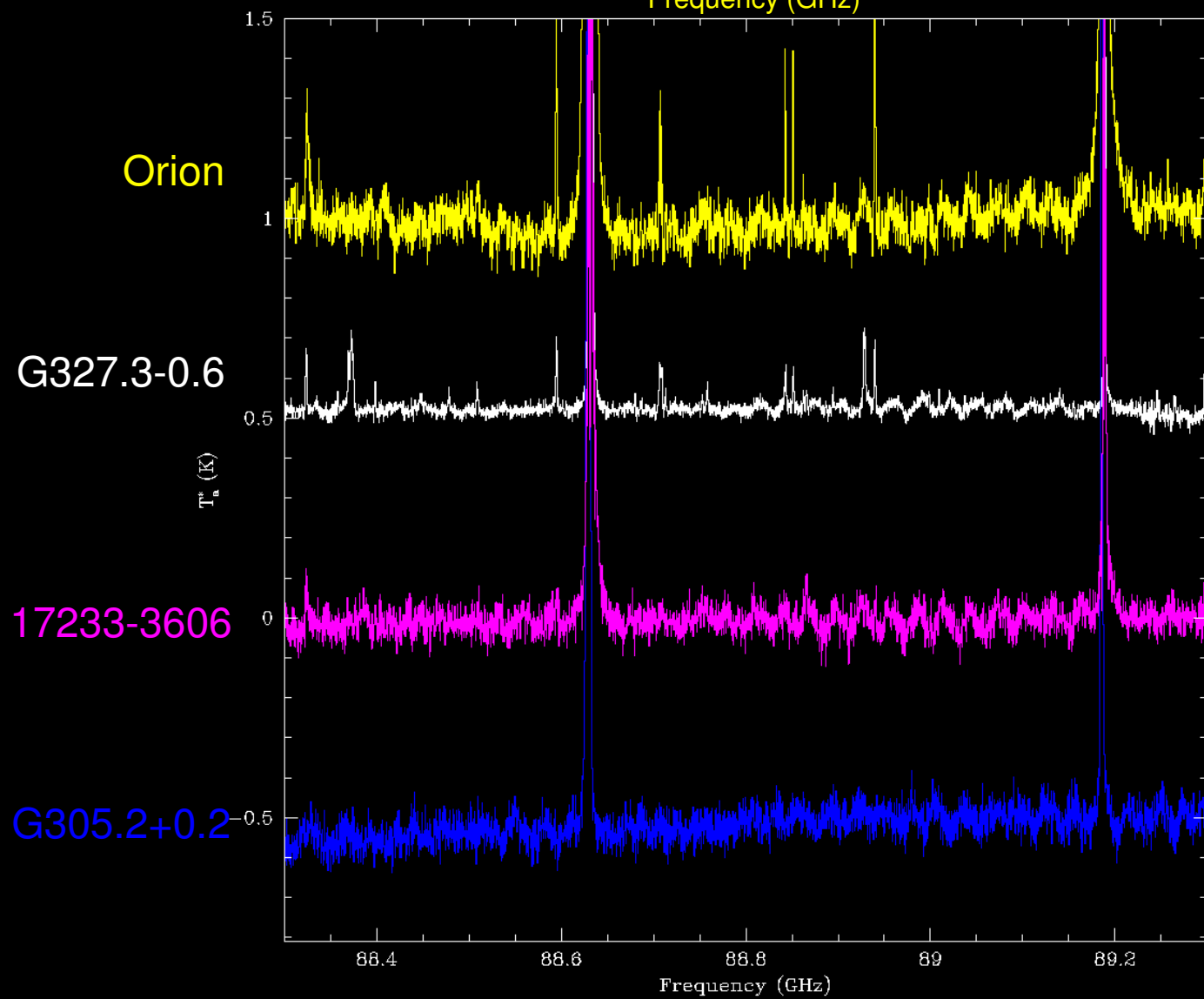
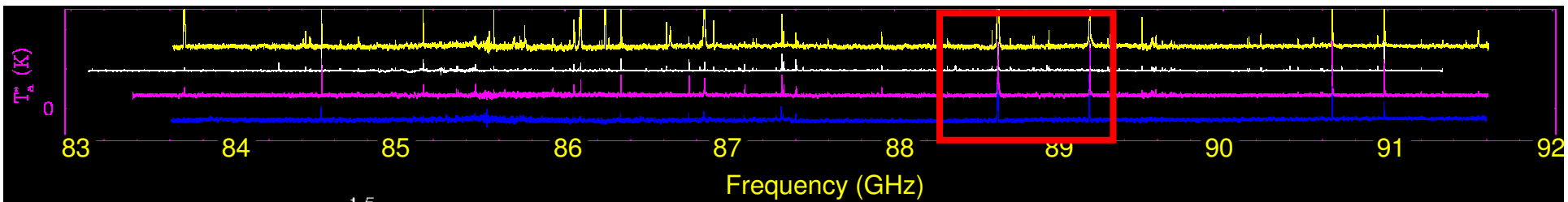
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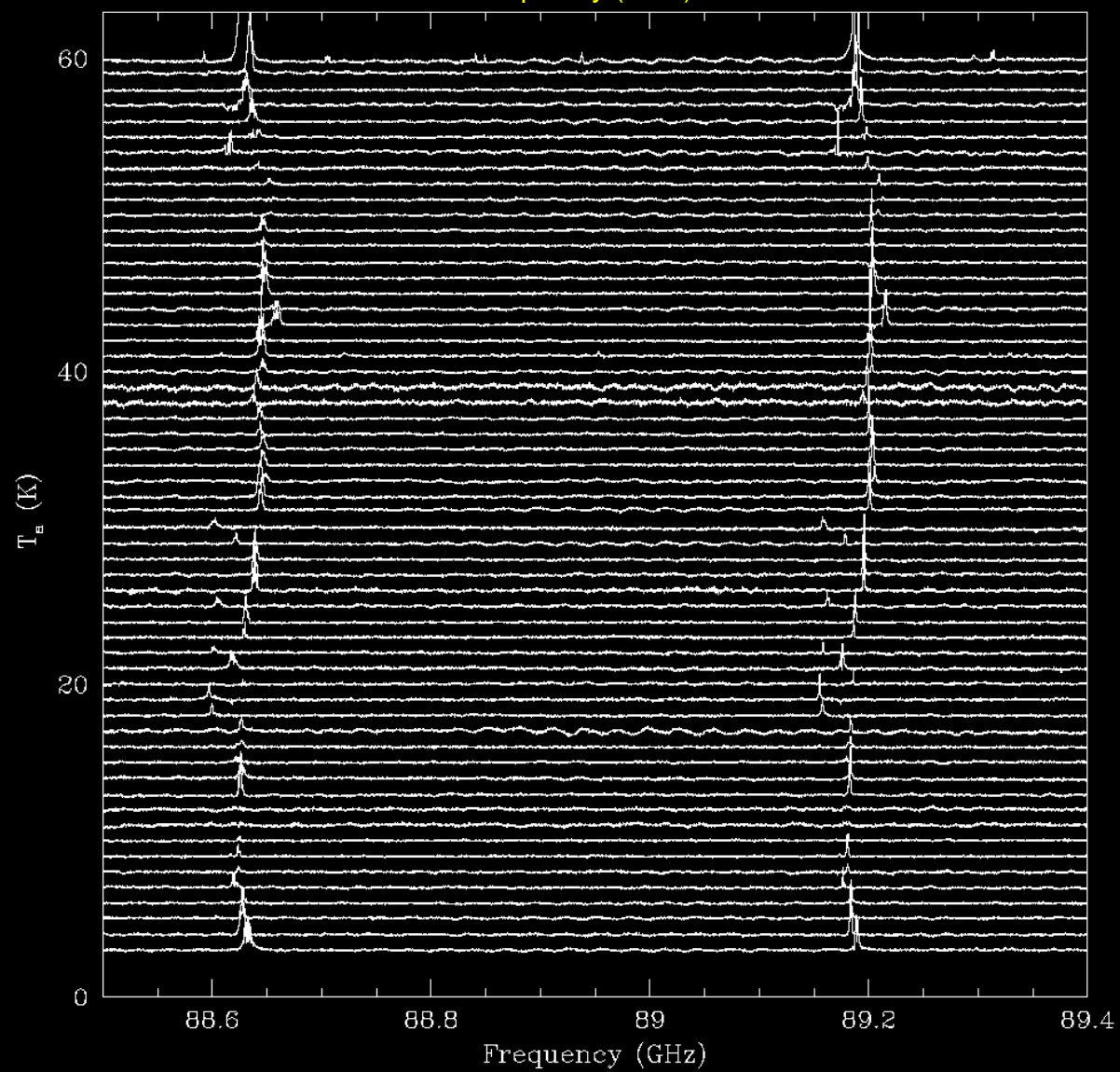
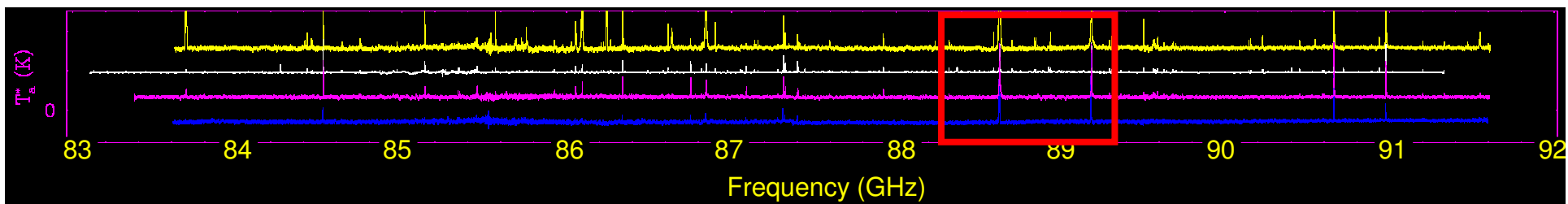
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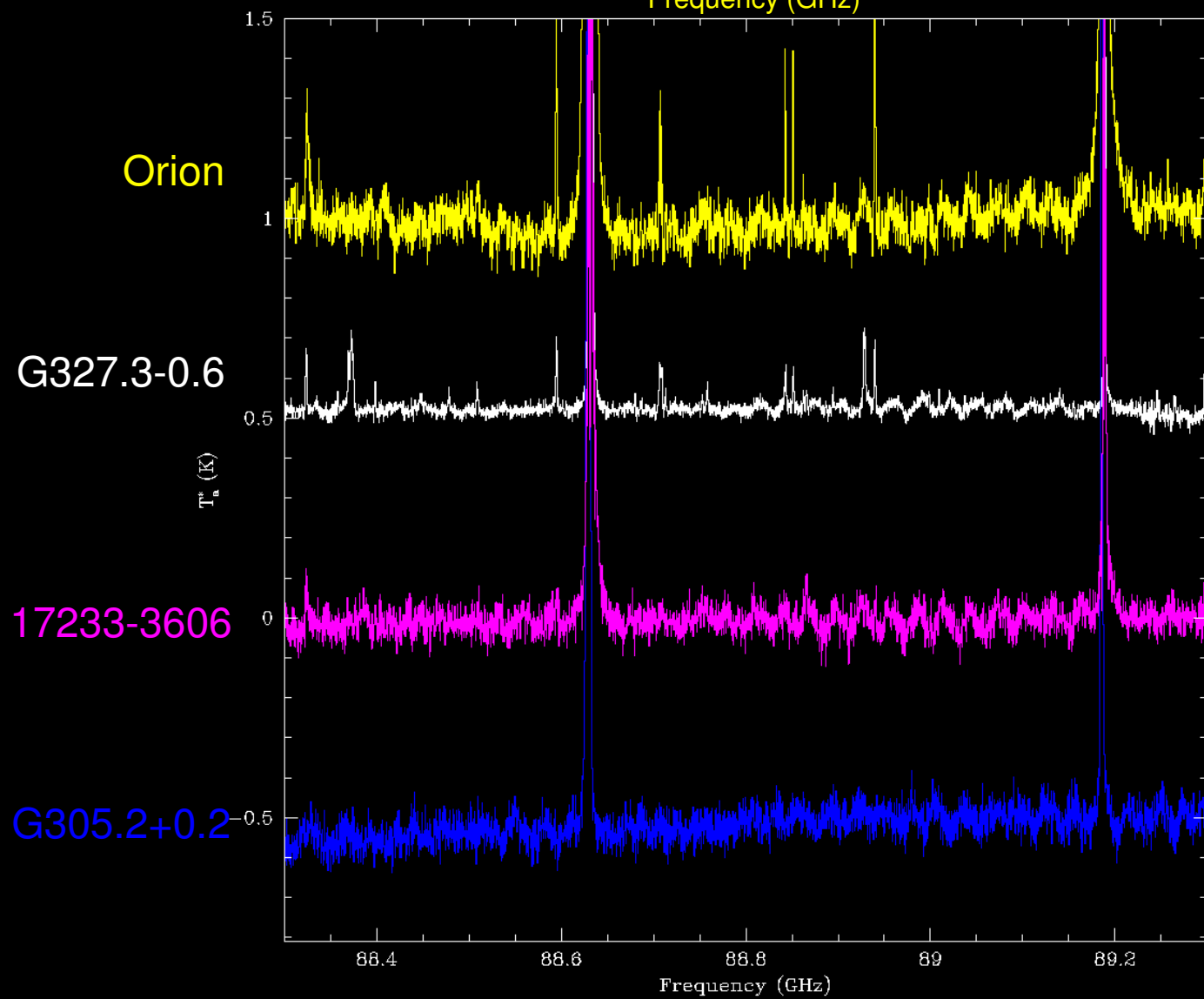
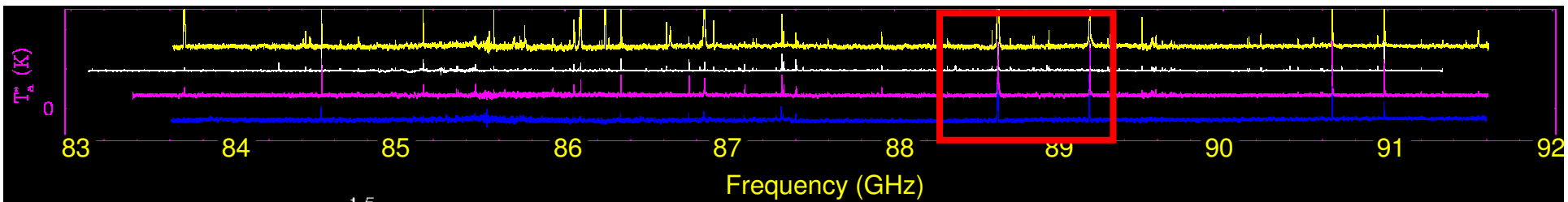
G305.2+0.2

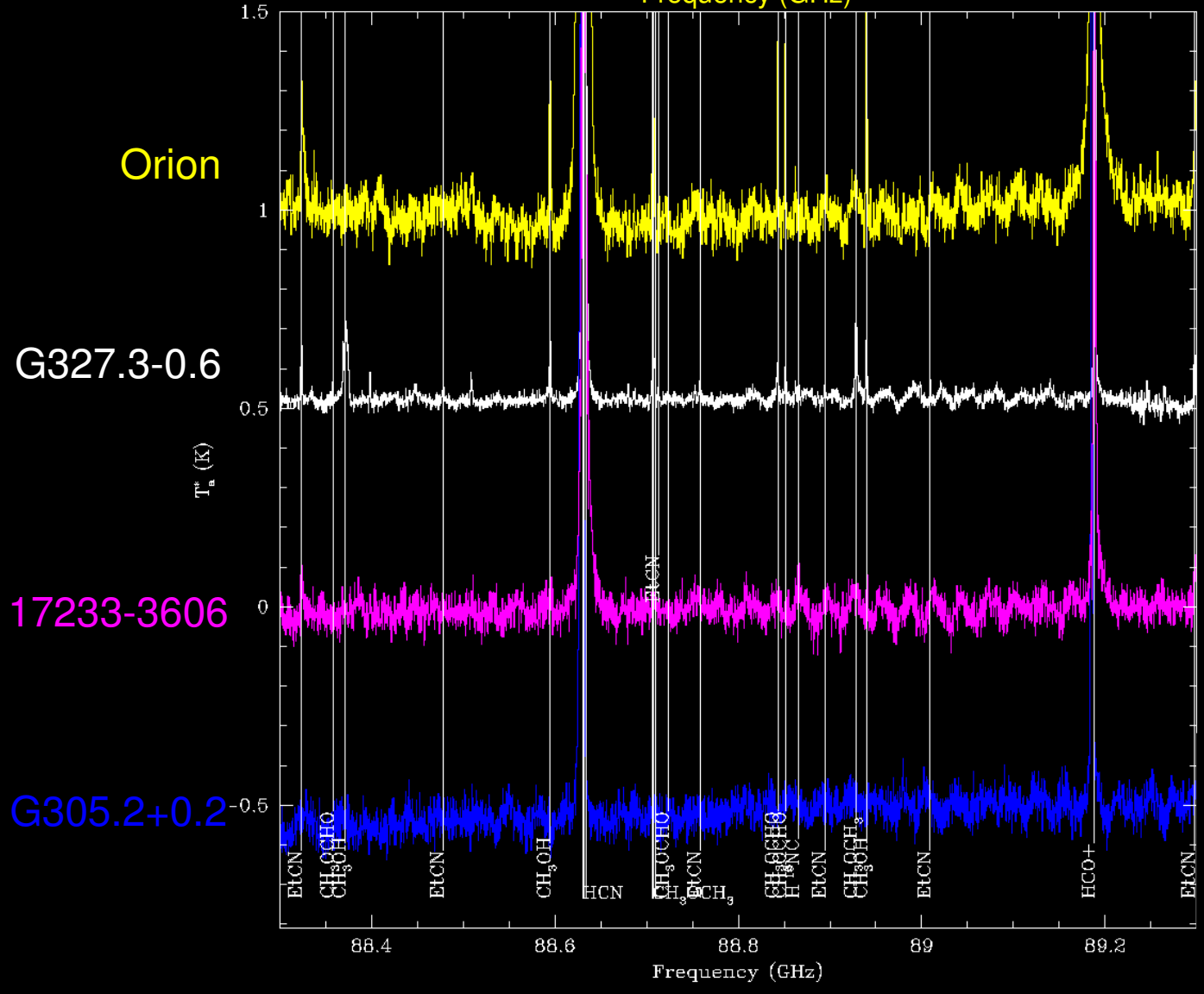
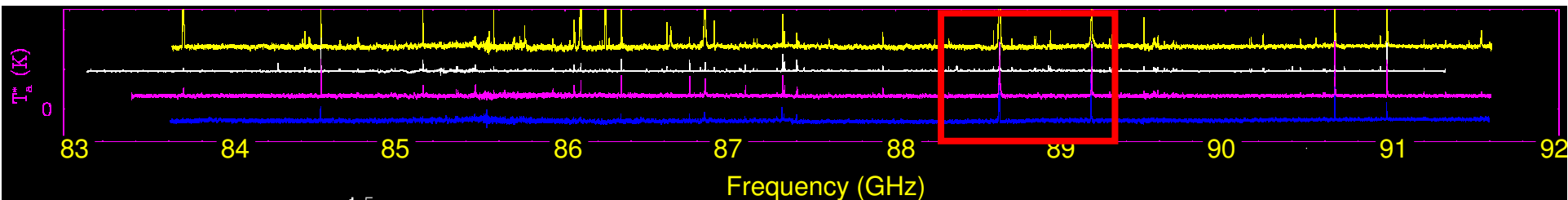


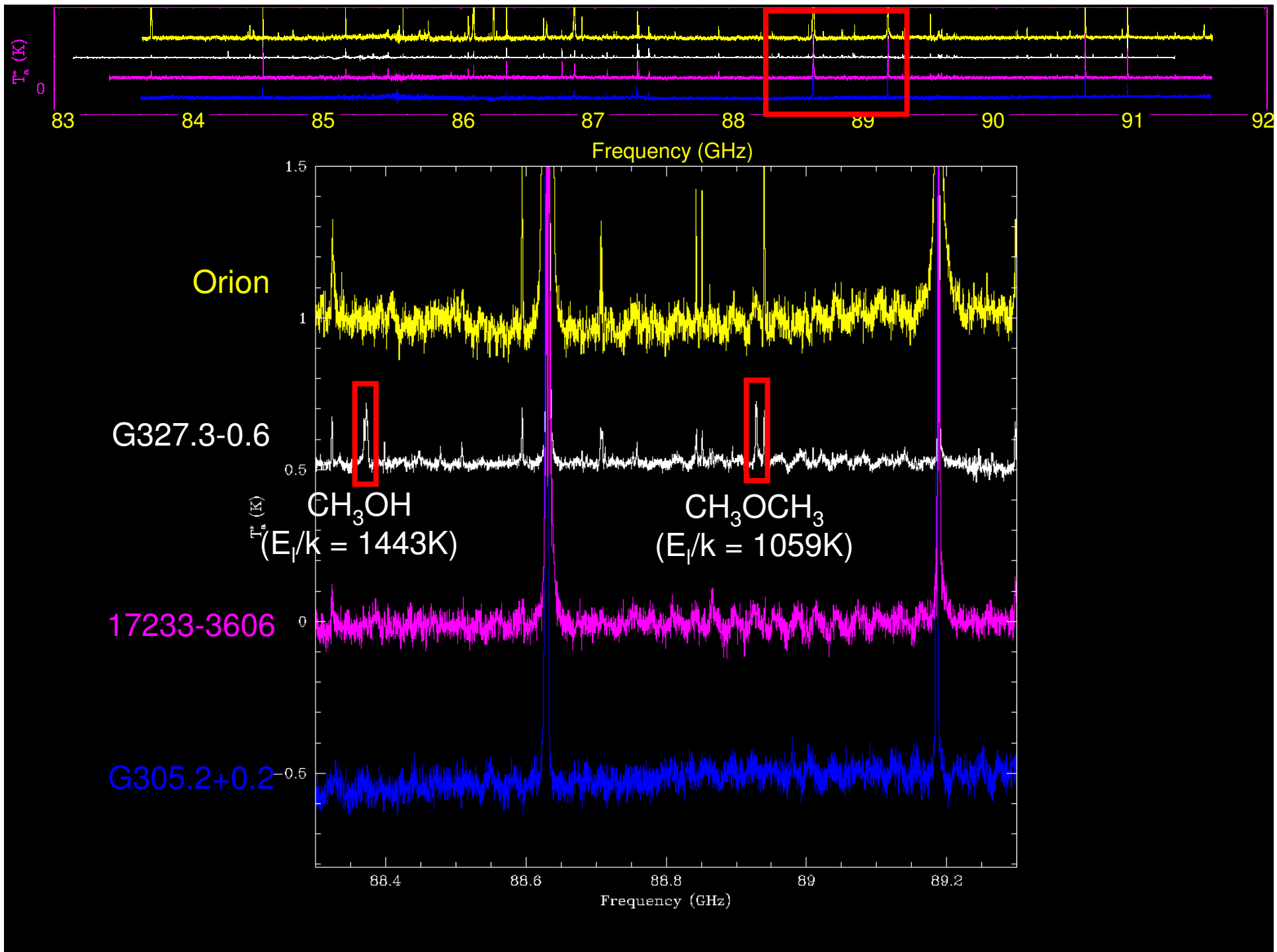


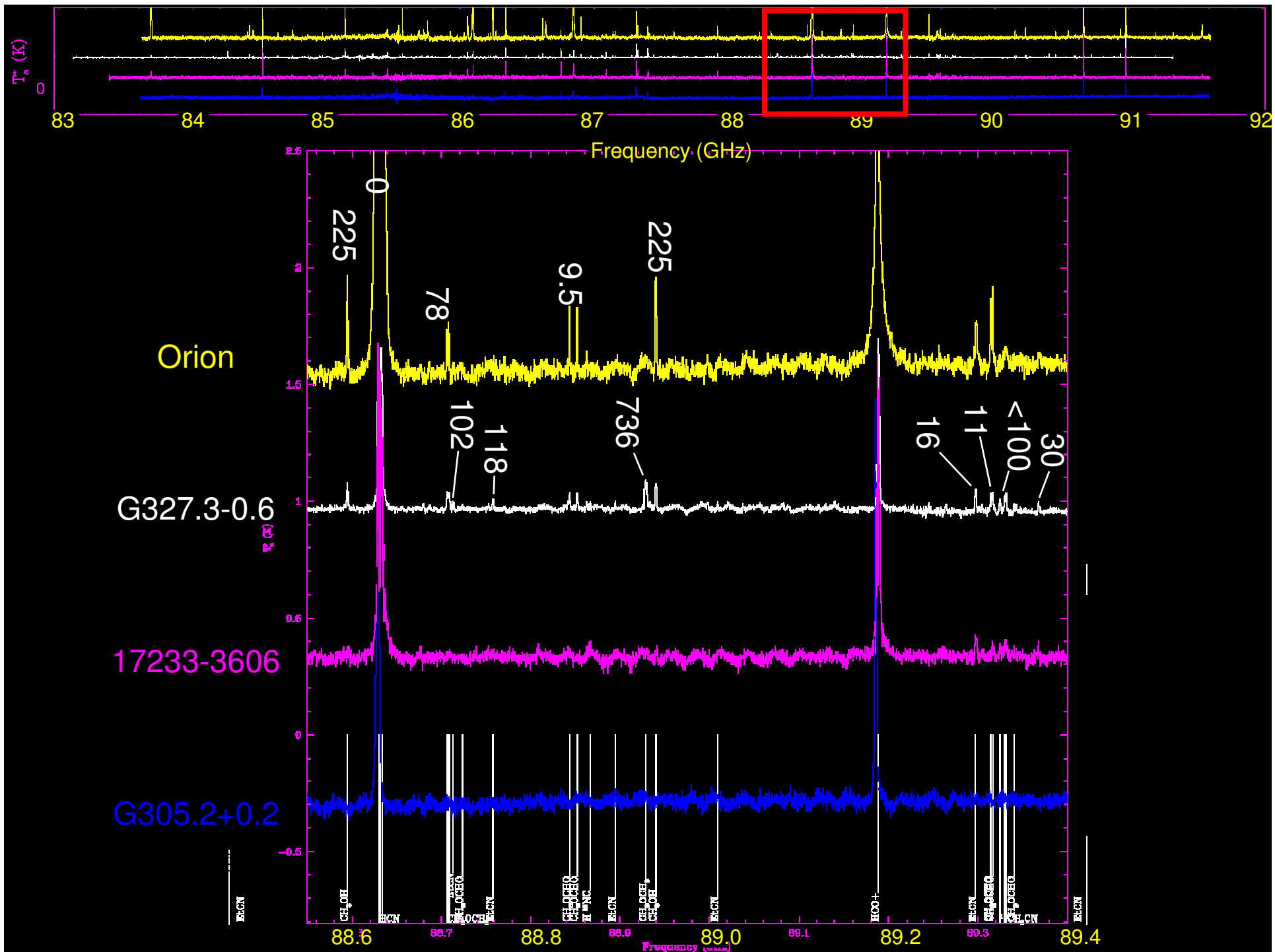








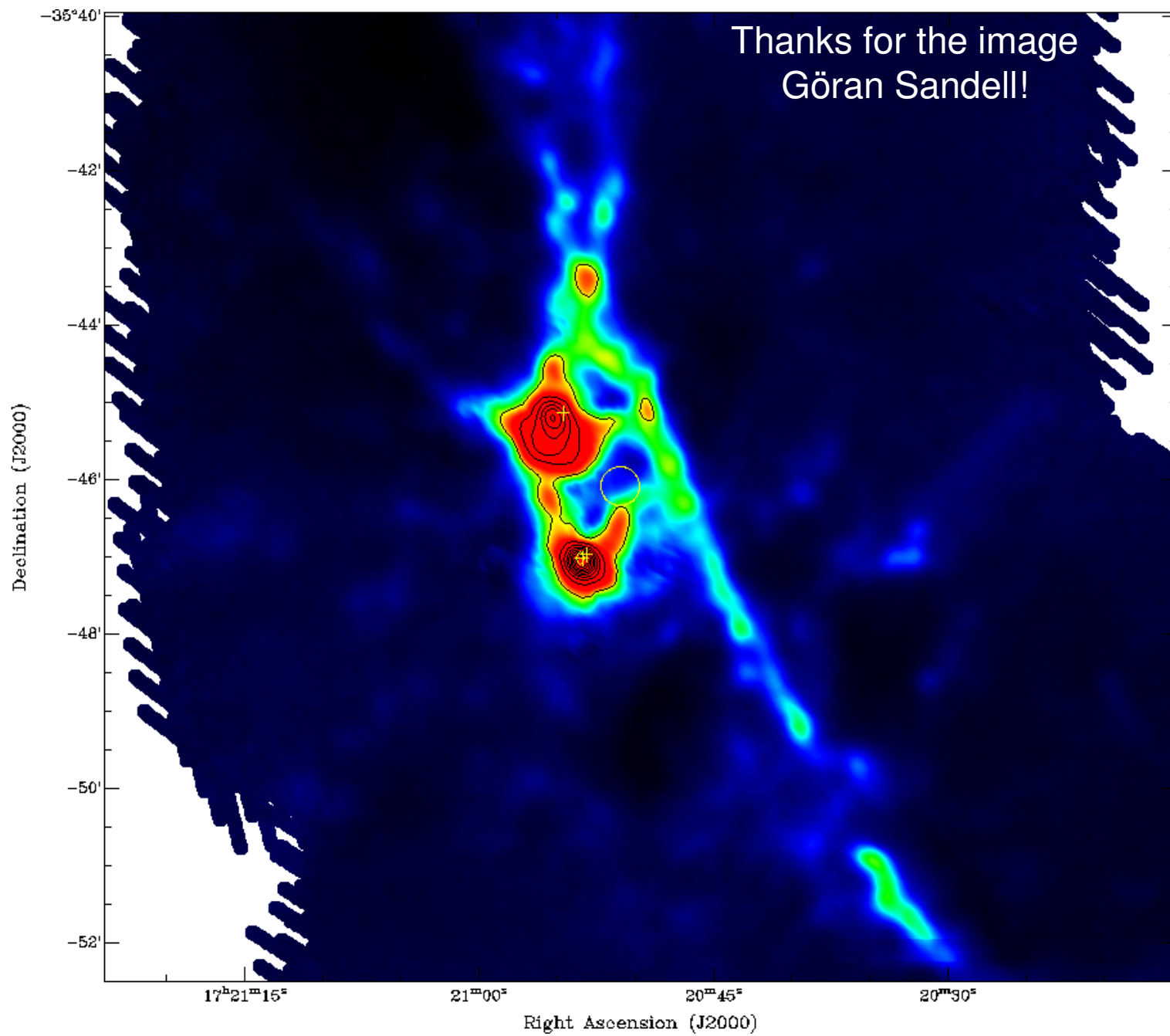




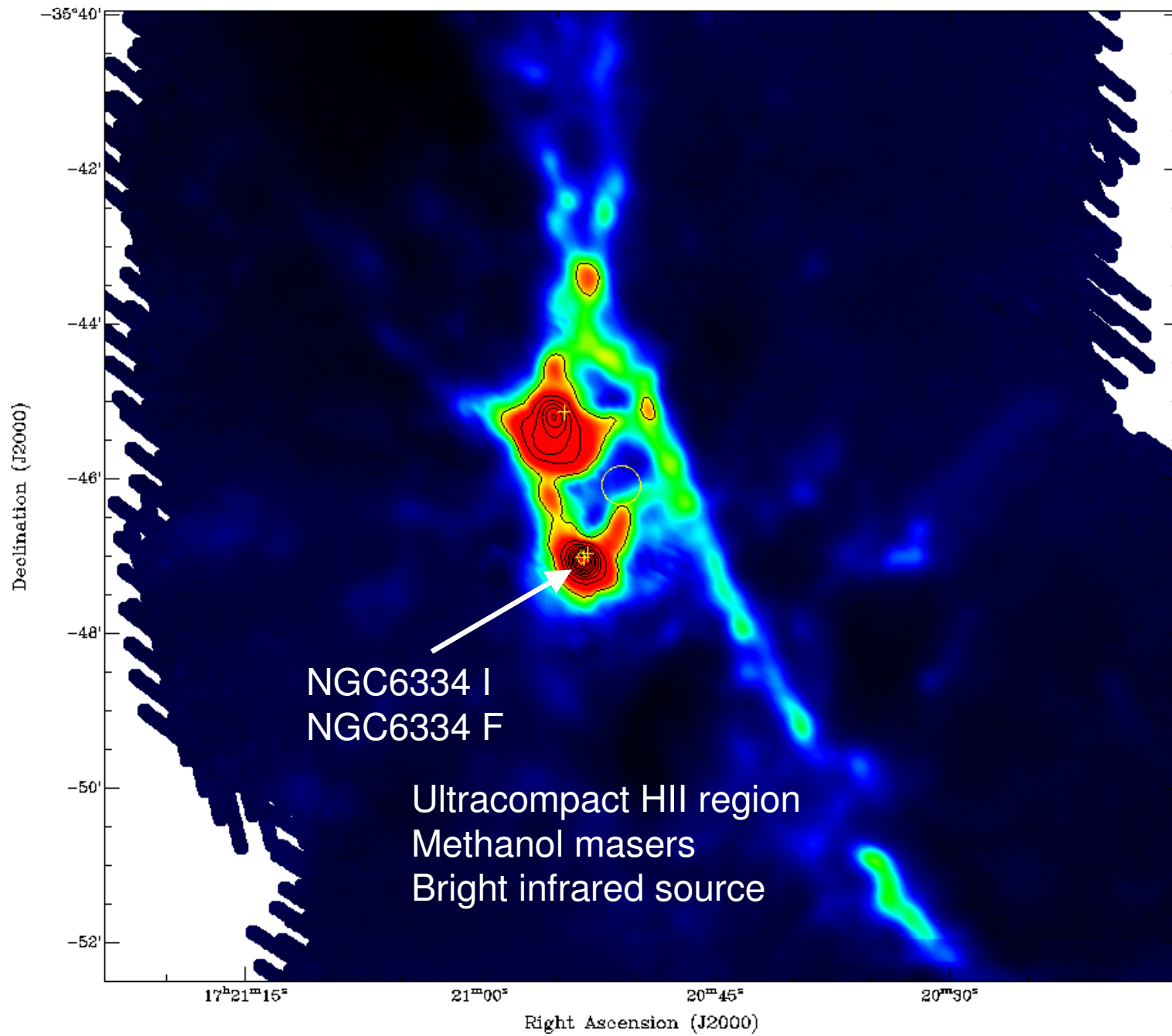
A large satellite dish antenna is shown at night, illuminated by a blue light source. The dish is a complex structure of metal beams and panels, mounted on a tall, white, A-frame support structure. The background is a dark blue sky, and the foreground shows silhouettes of trees and a fence. The text "Line survey maps" is overlaid in white, centered on the dish.

Line survey maps

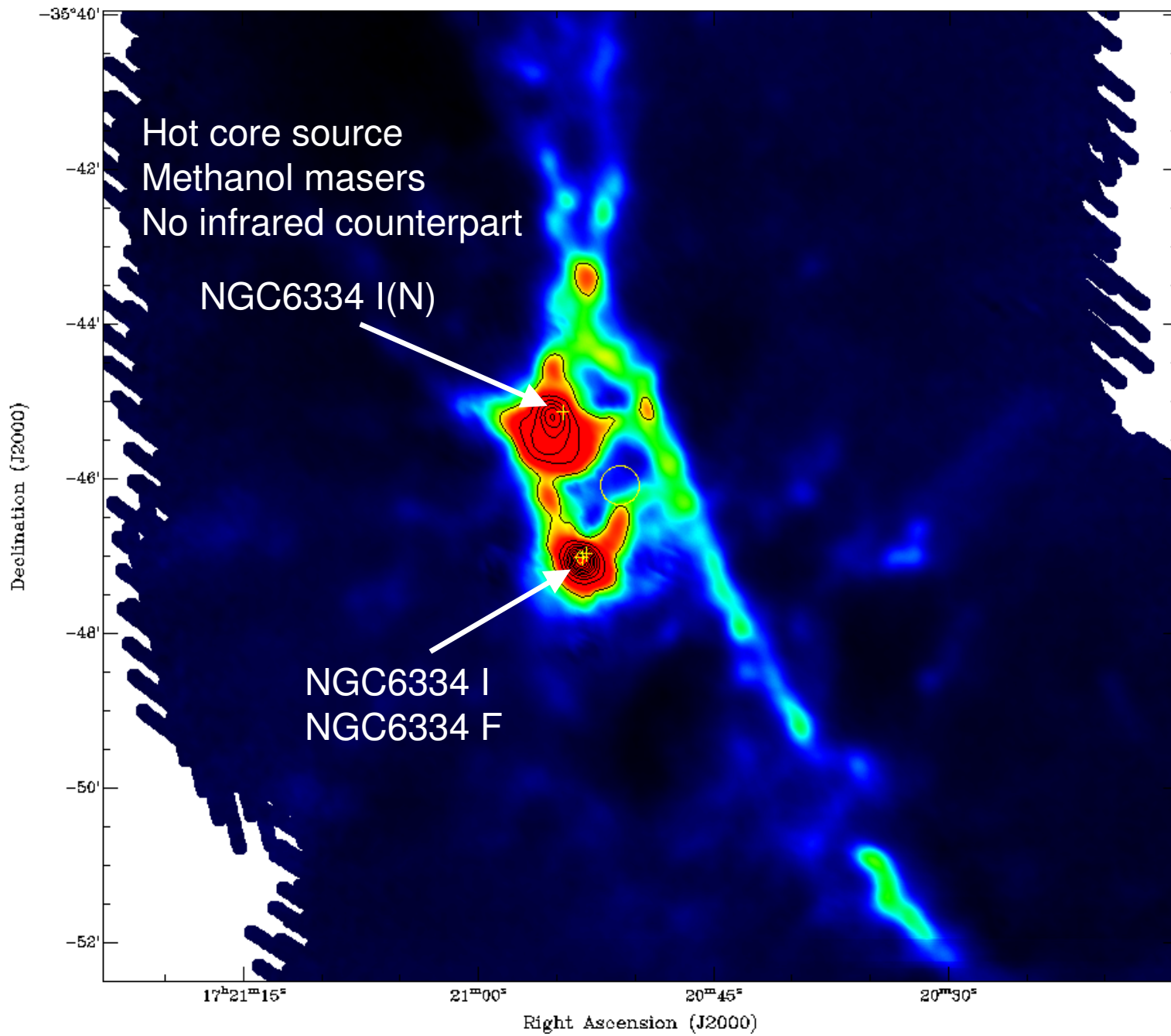
SCUBA 850 μm dust continuum map of northern NGC6334



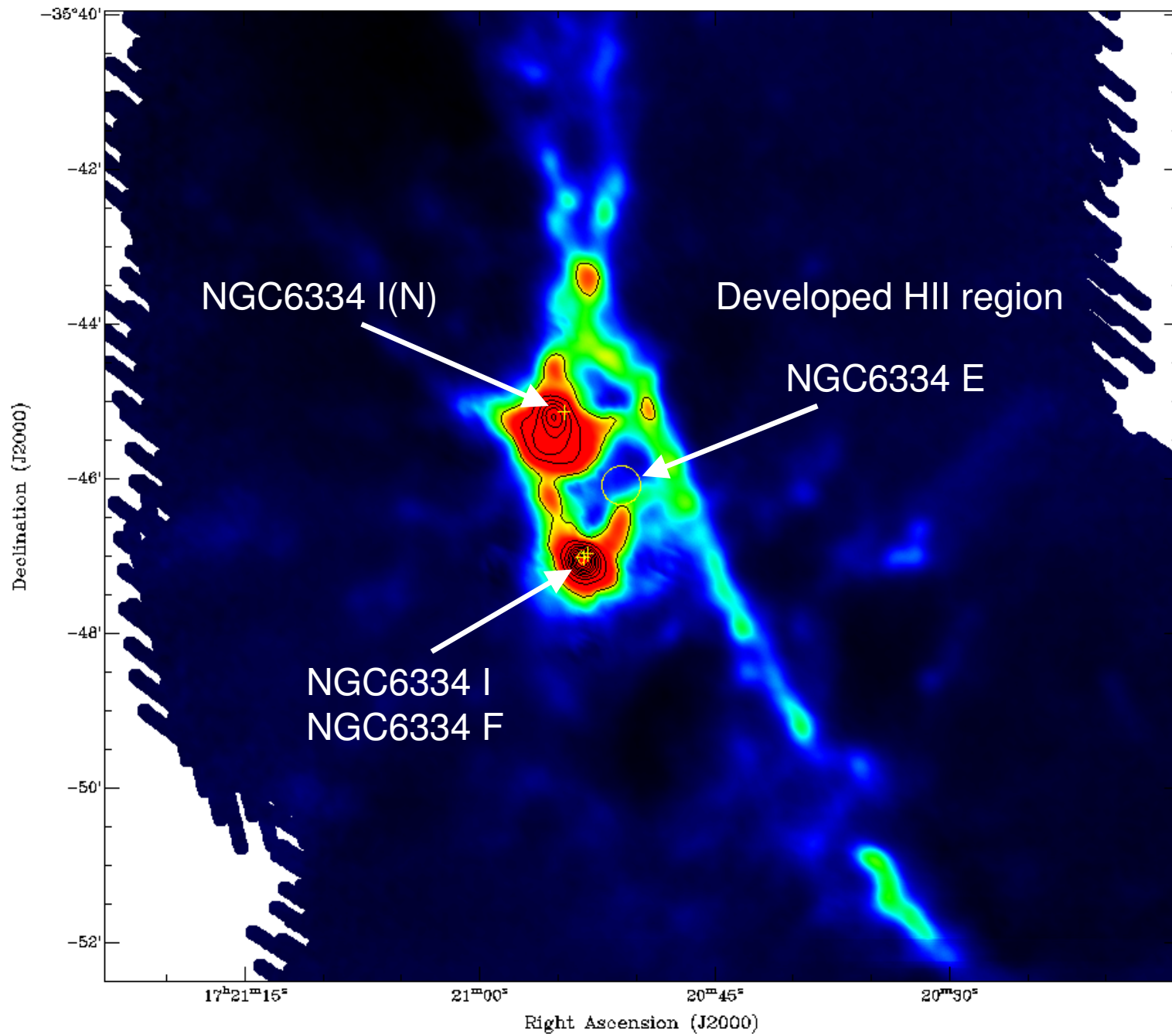
SCUBA 850 μm dust continuum map of northern NGC6334



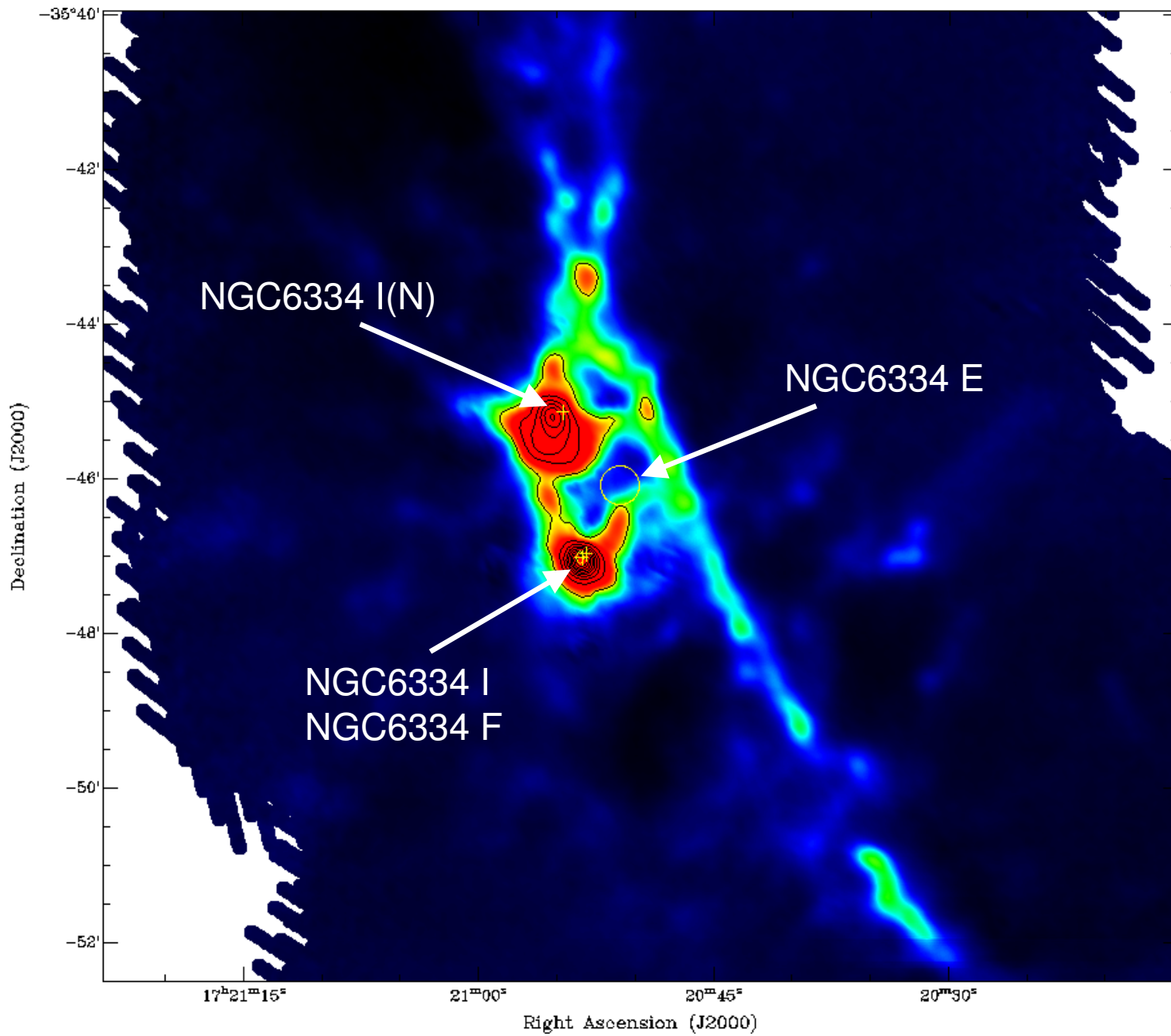
SCUBA 850 μm dust continuum map of northern NGC6334



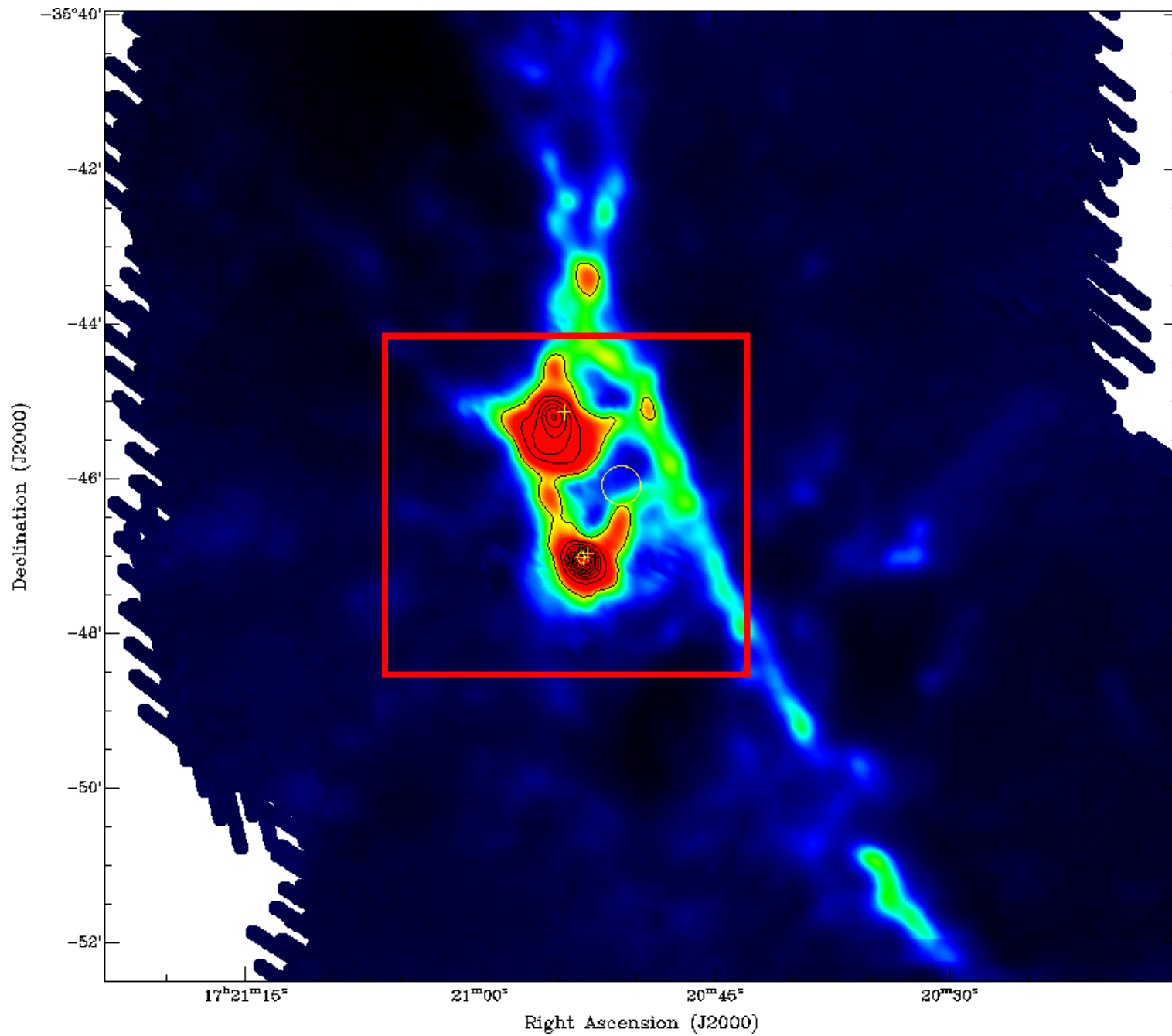
SCUBA 850 μm dust continuum map of northern NGC6334



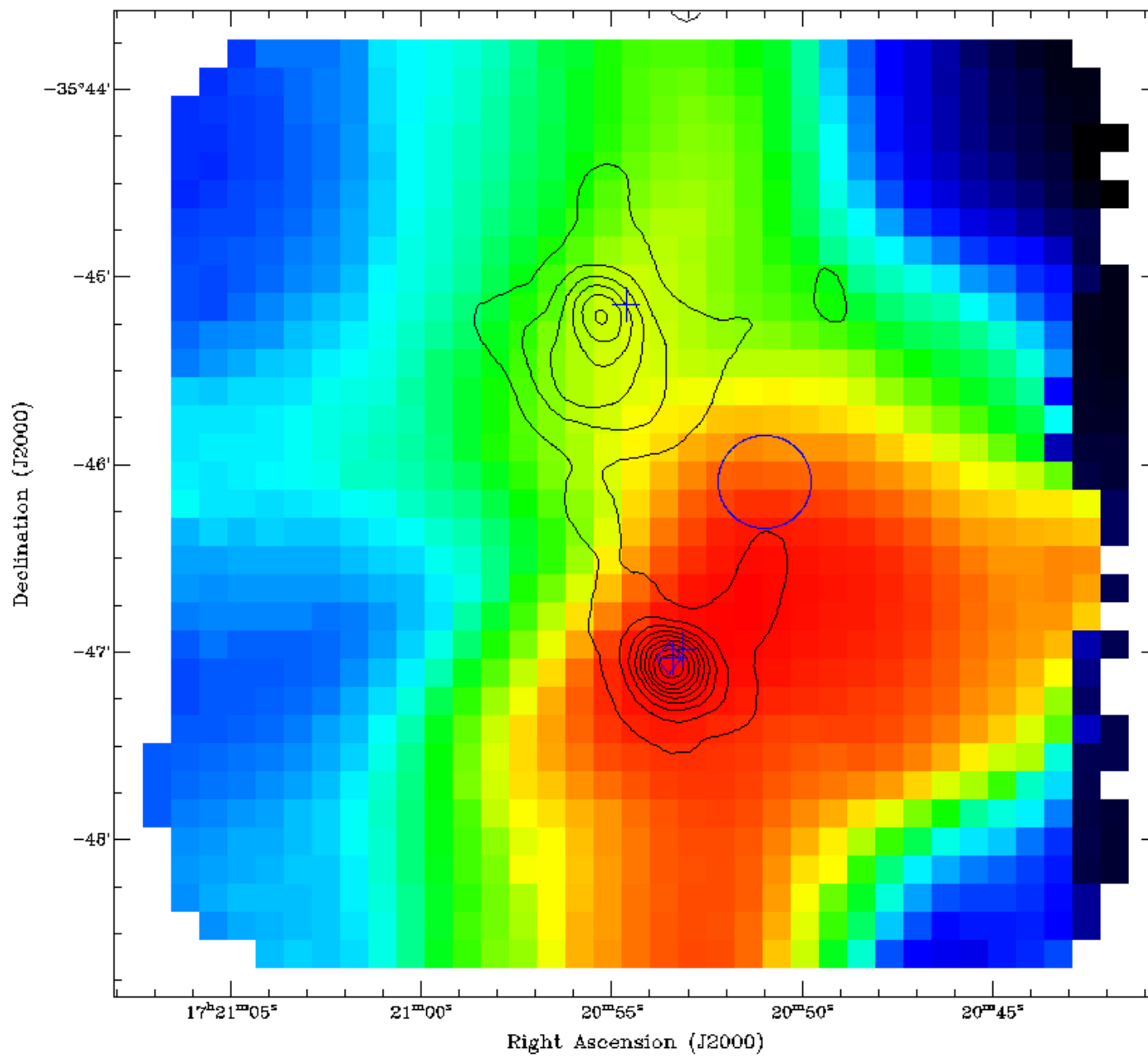
SCUBA 850 μm dust continuum map of northern NGC6334



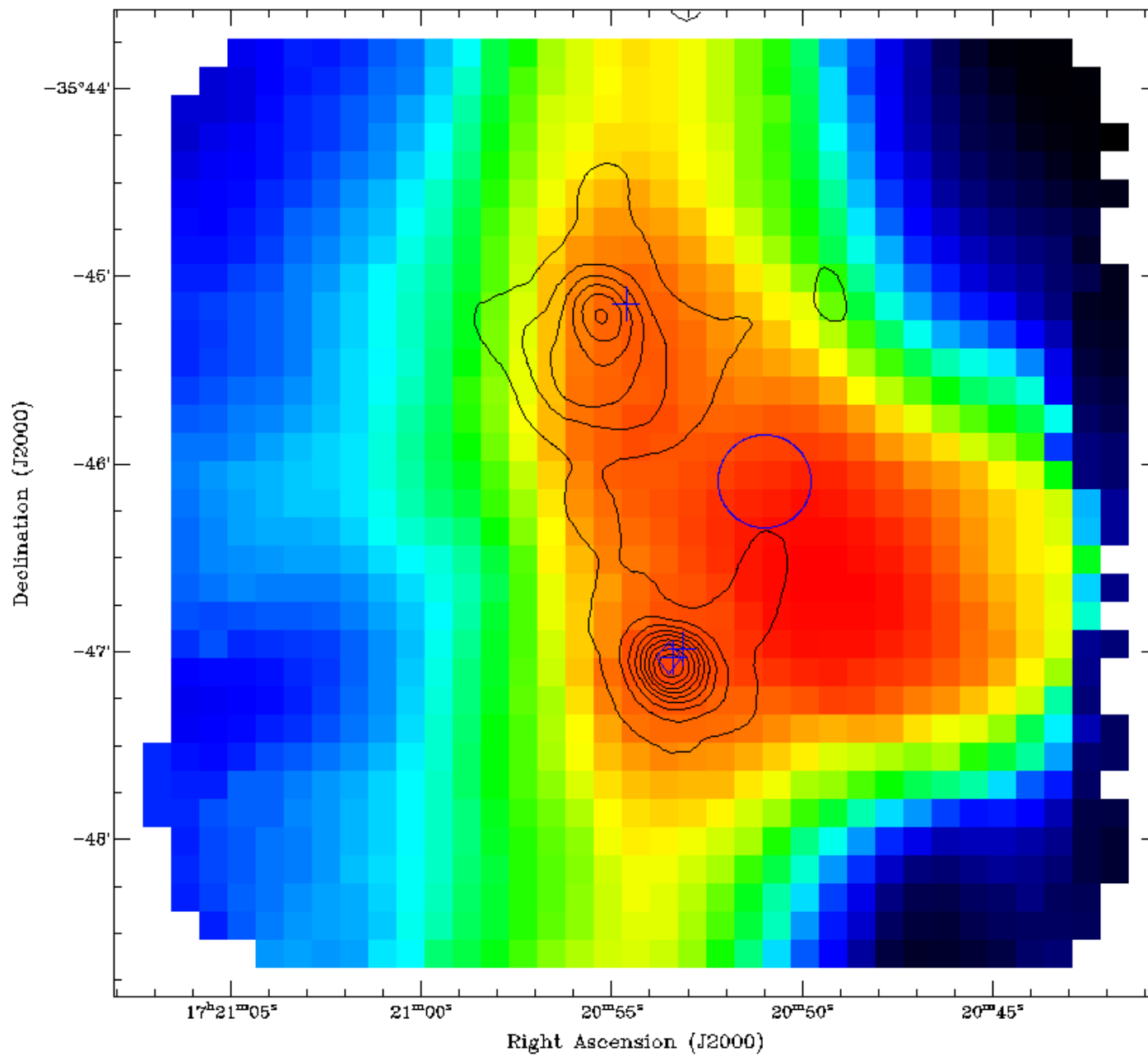
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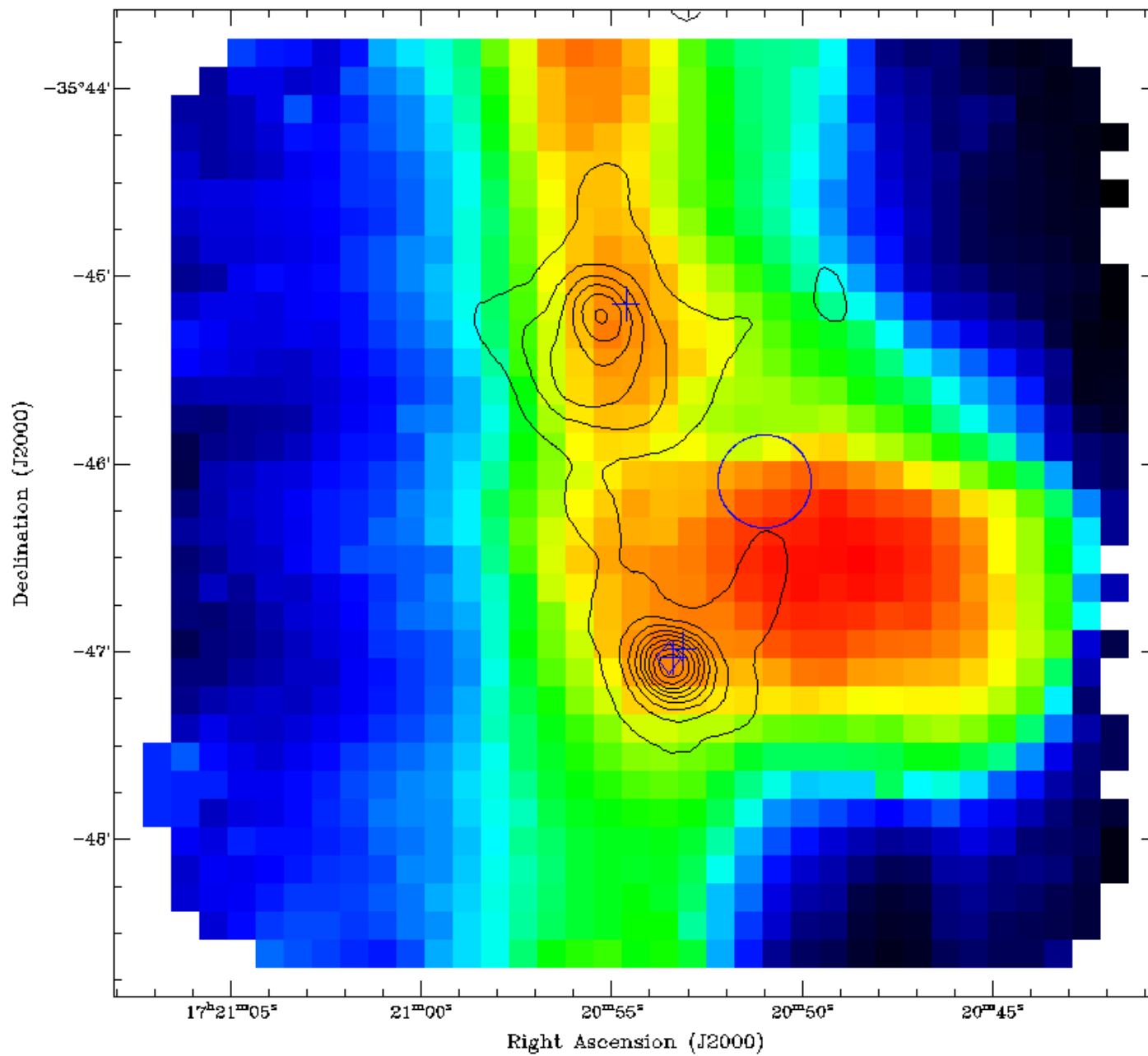
^{12}CO (1-0)



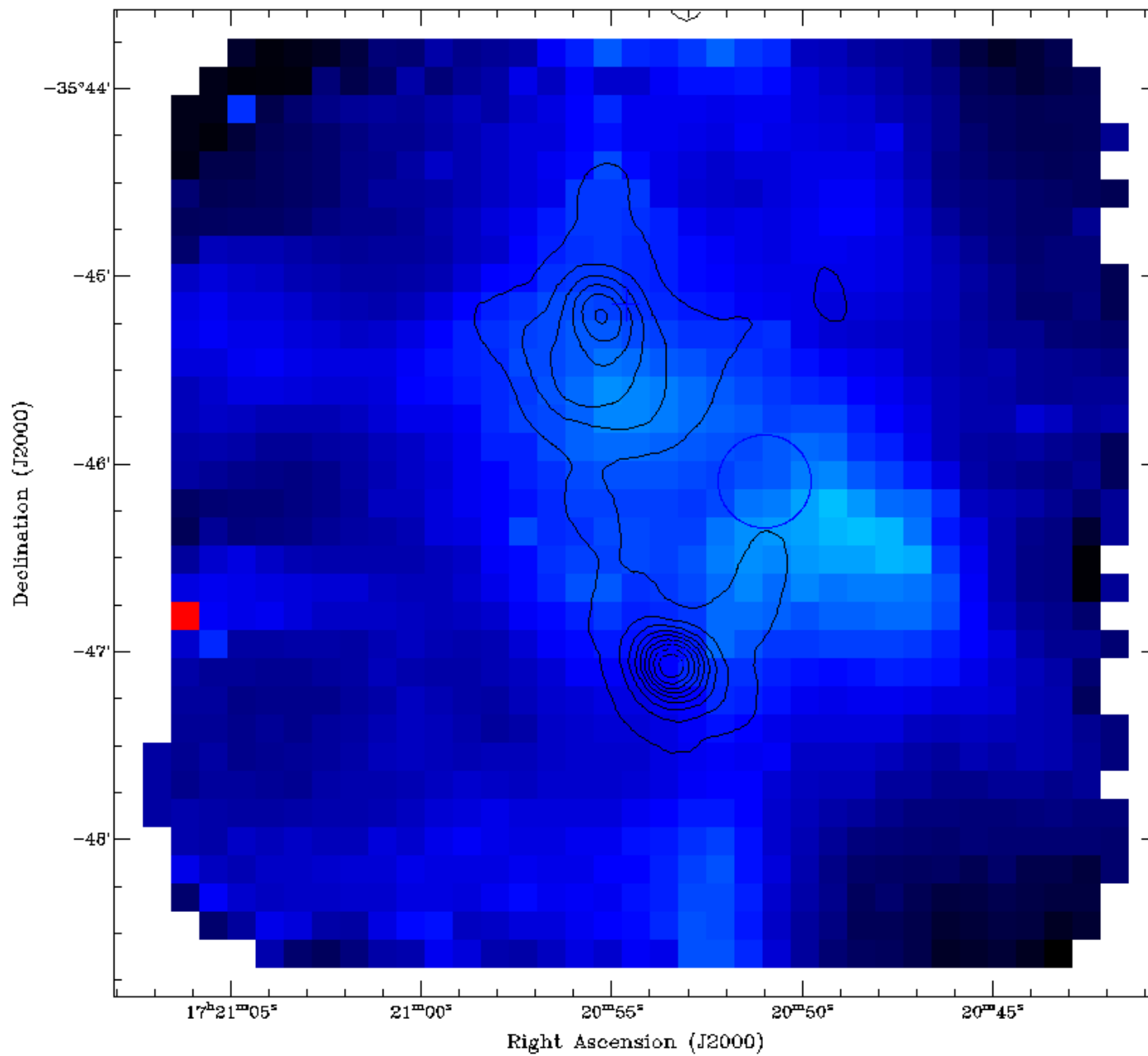
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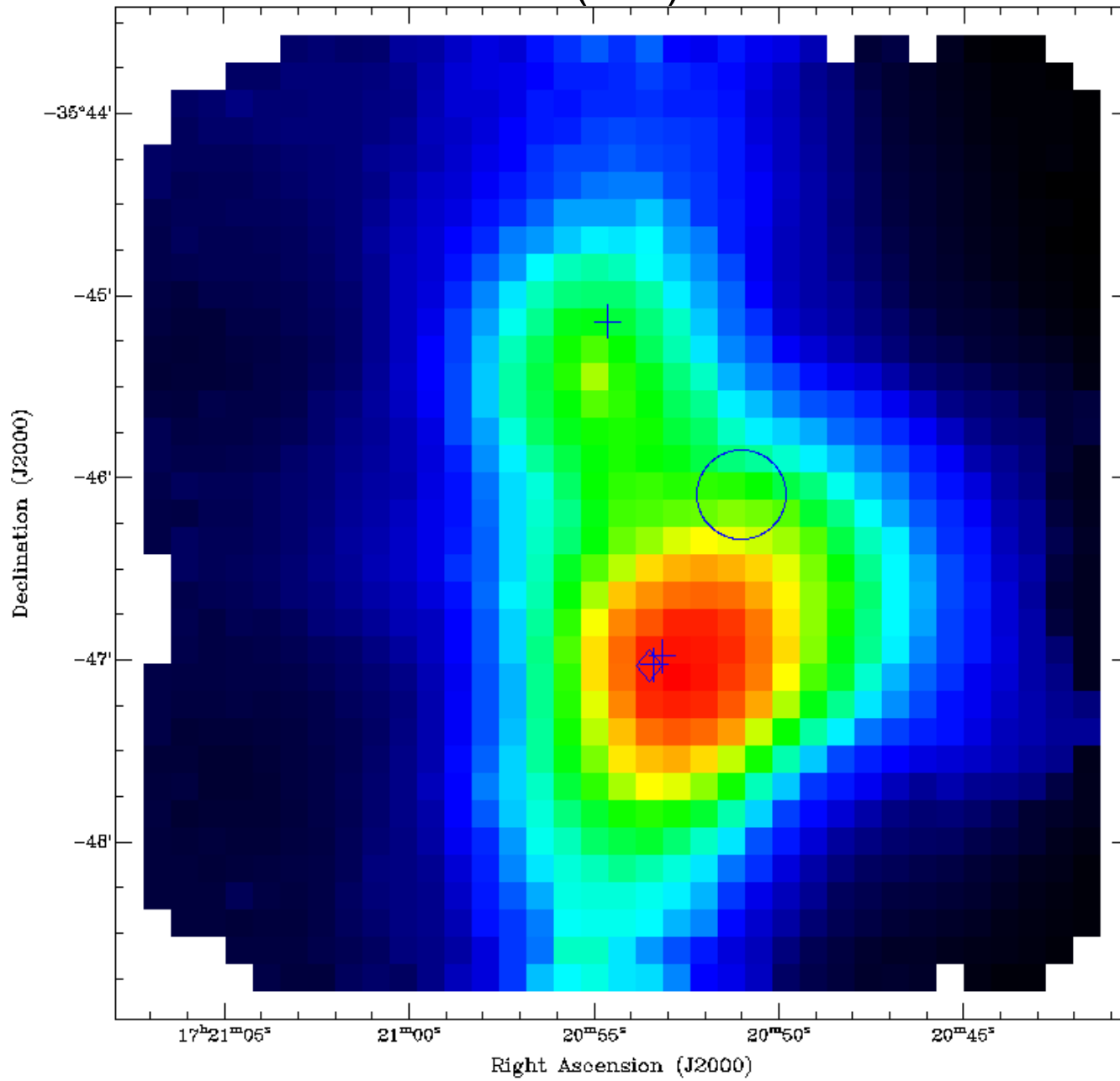
C¹⁸O (1-0)



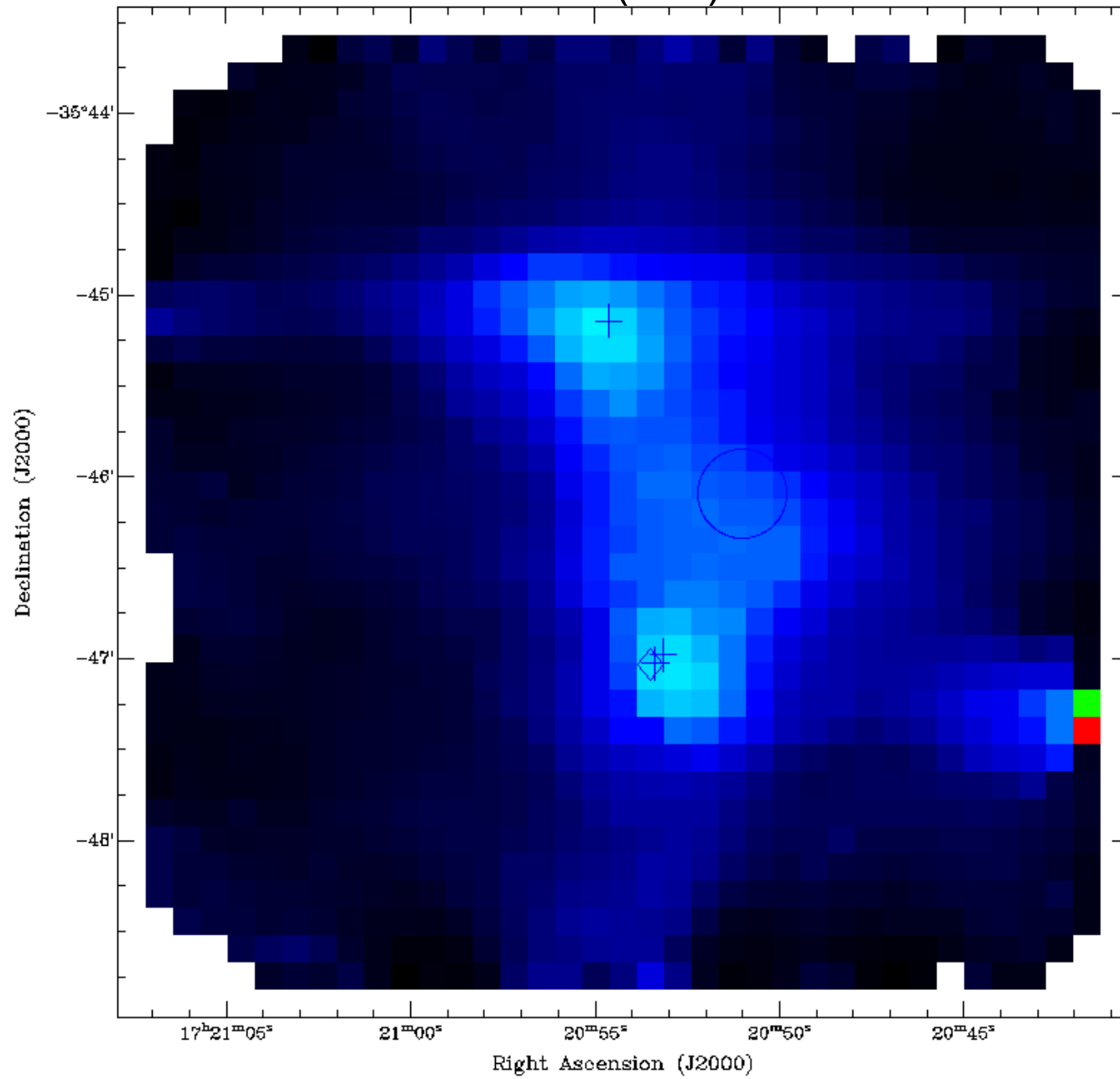
C¹⁷O (1-0)



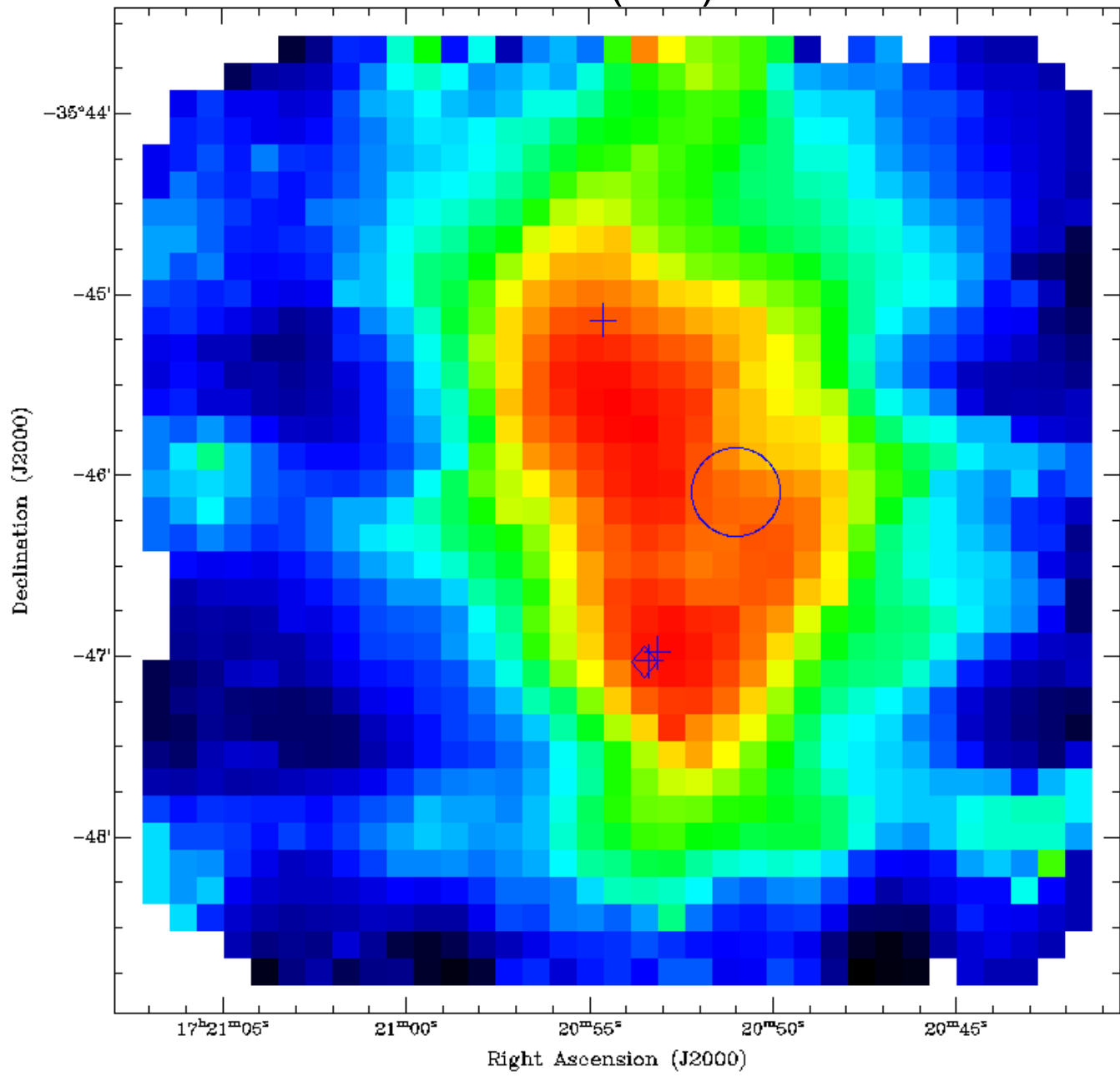
CS (2-1)



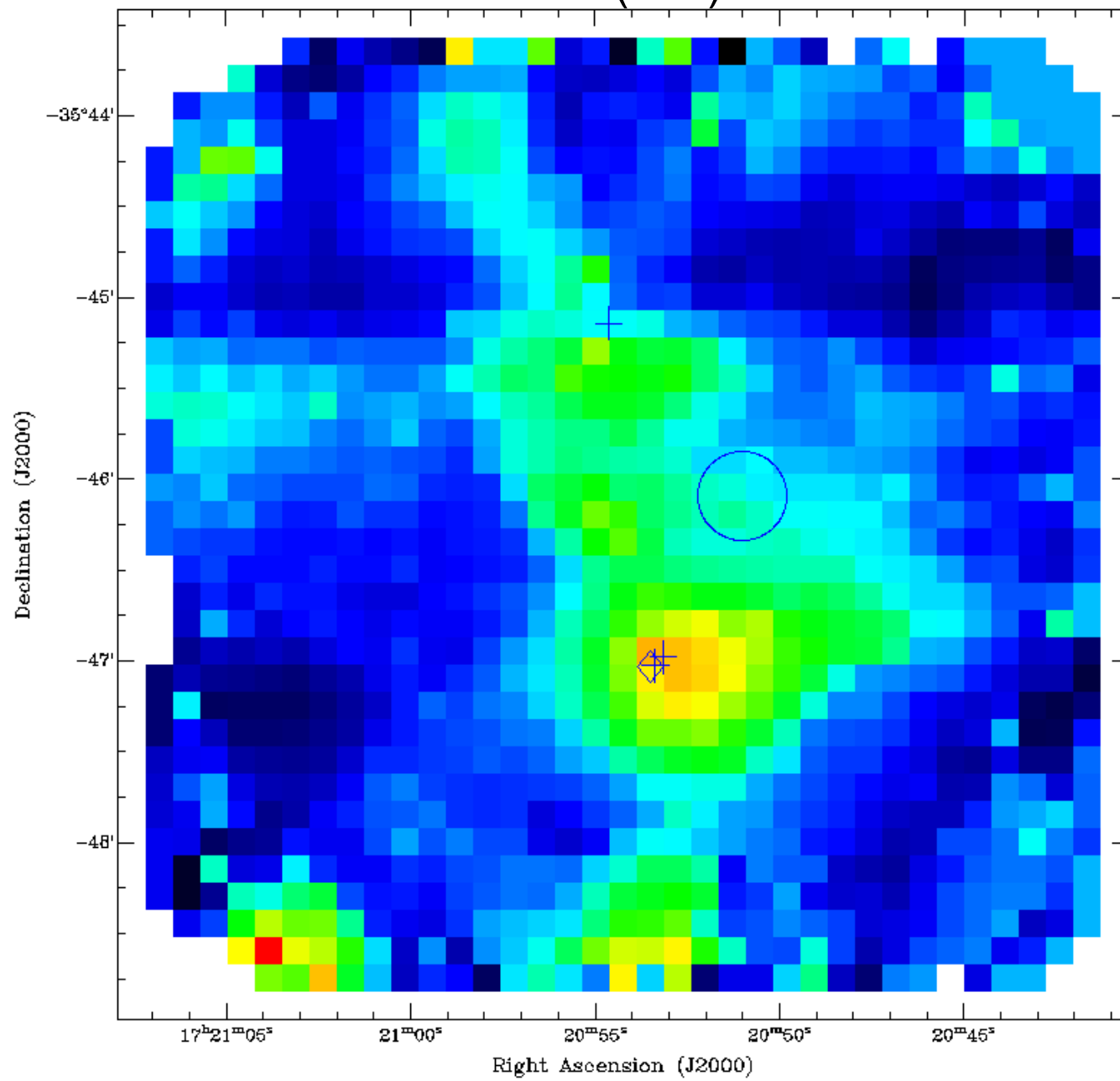
C³⁴S (2-1)



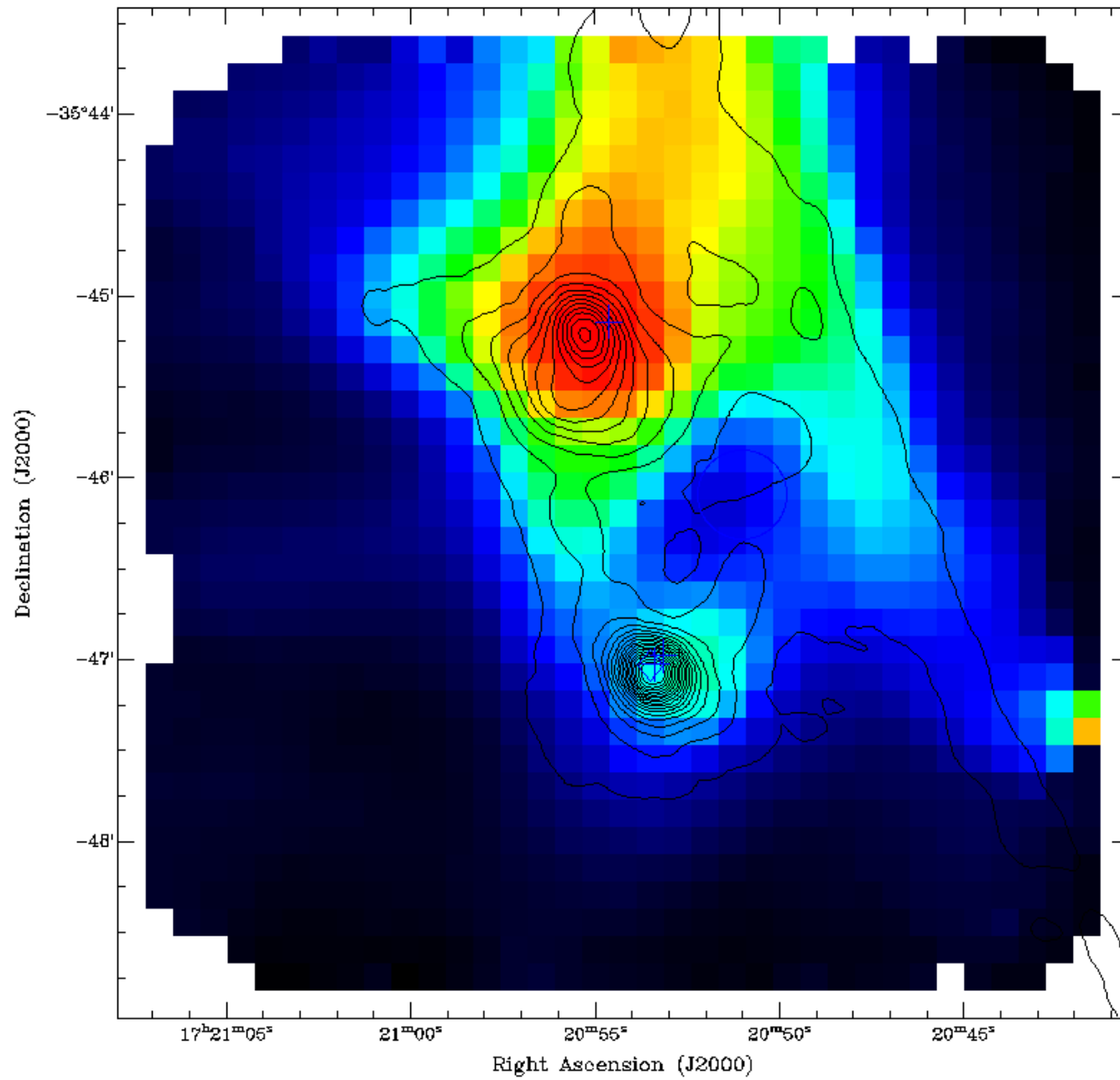
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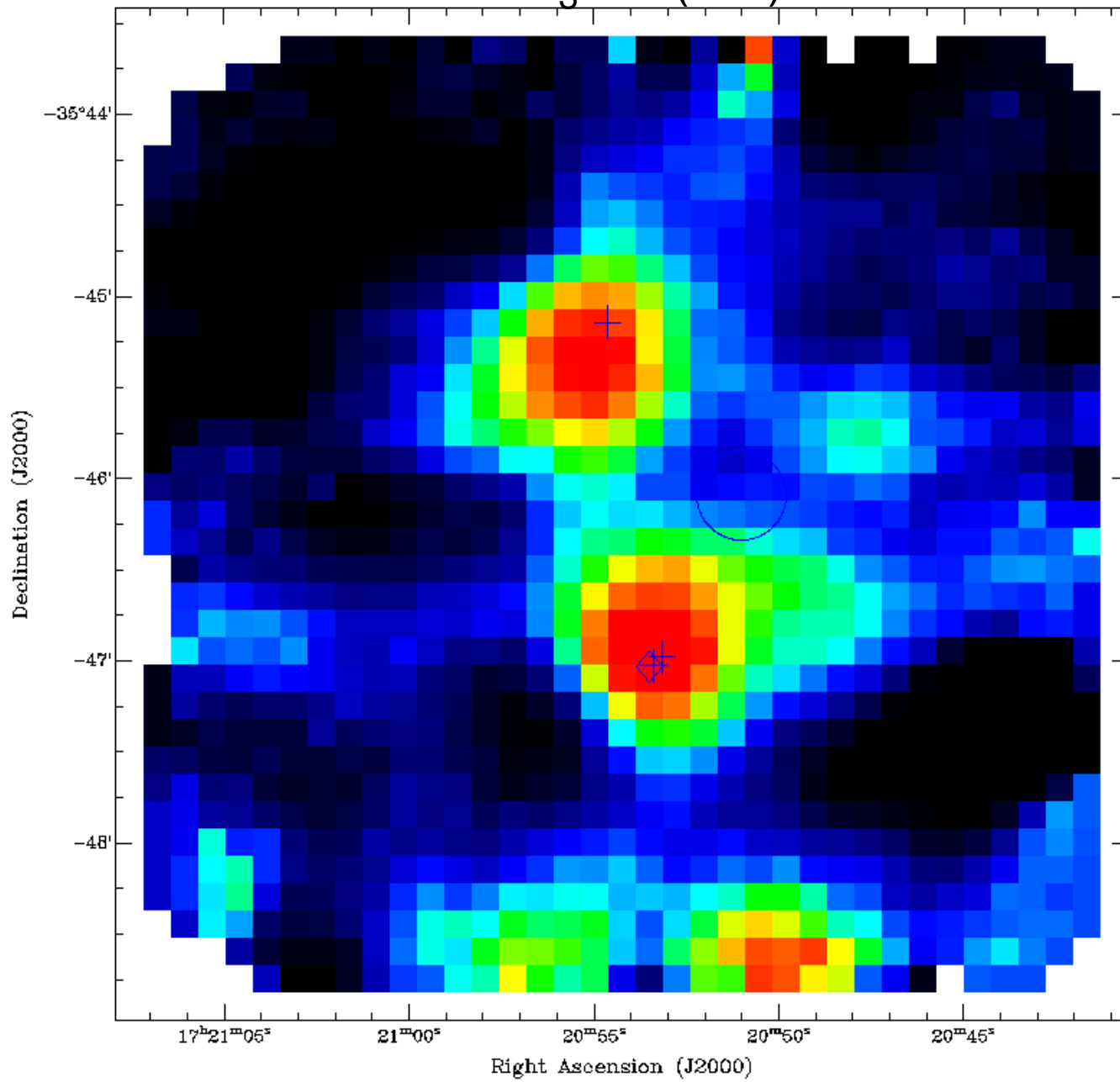
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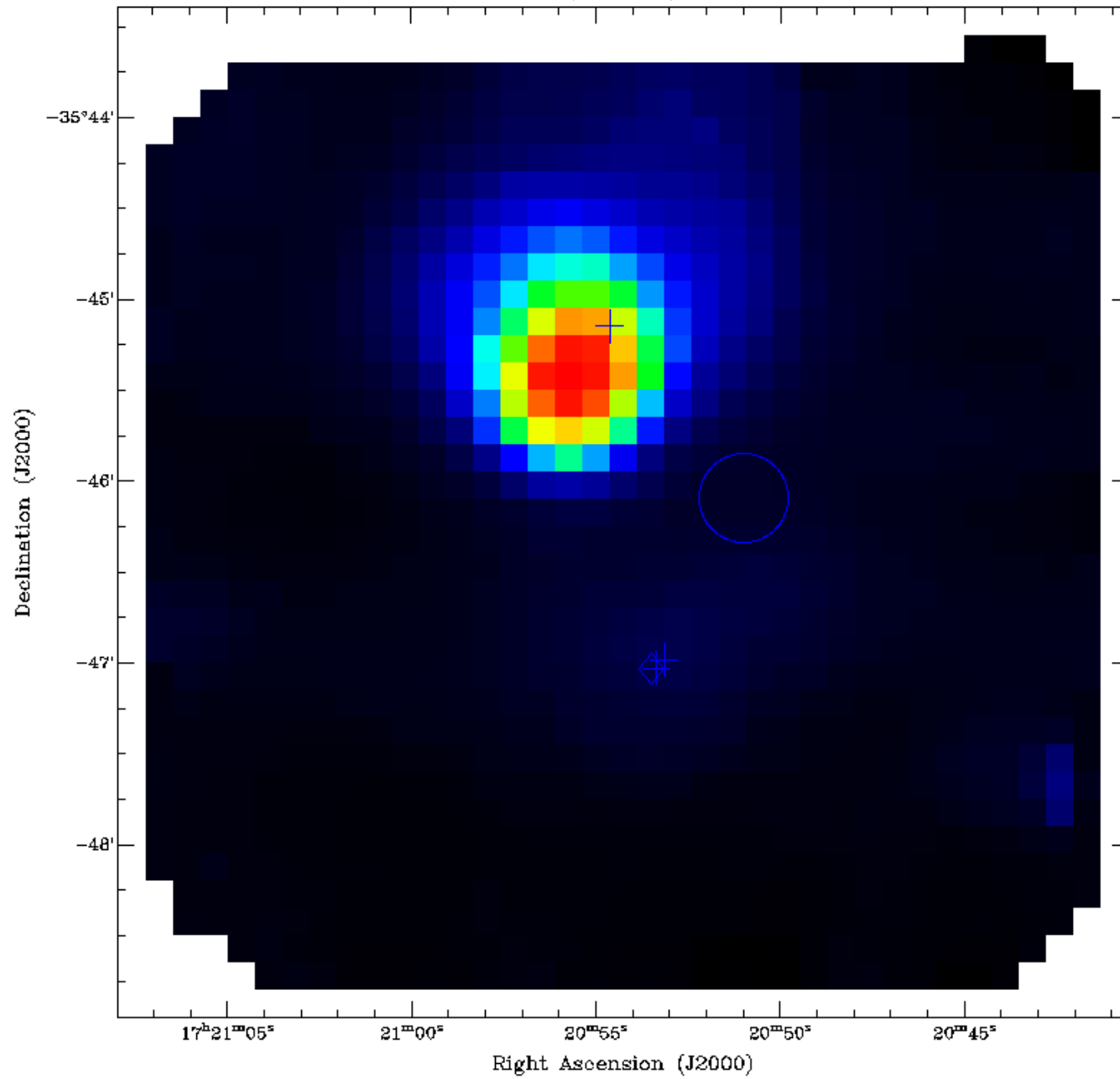
N_2H^+ (1-0)

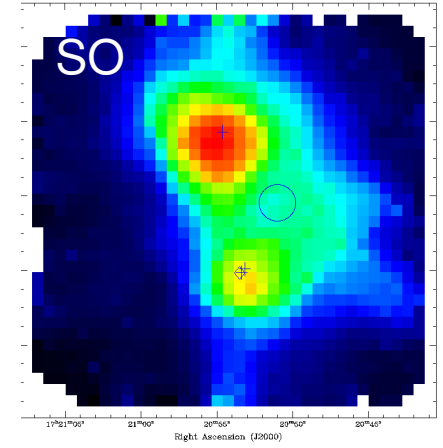
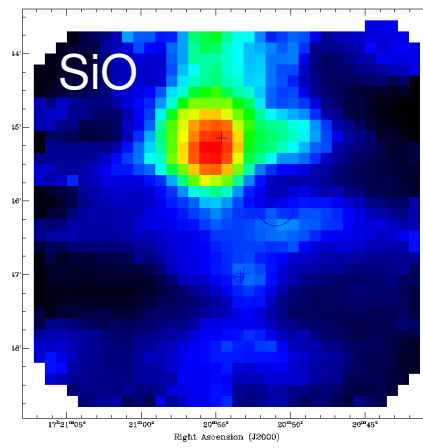
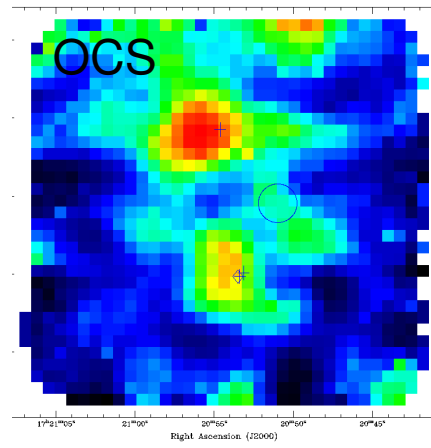
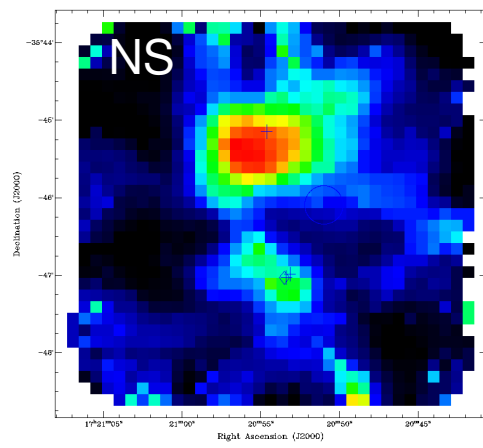
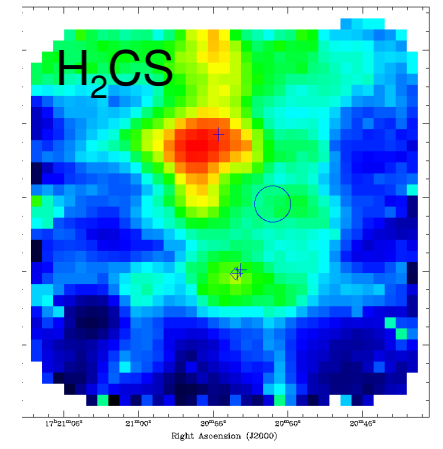
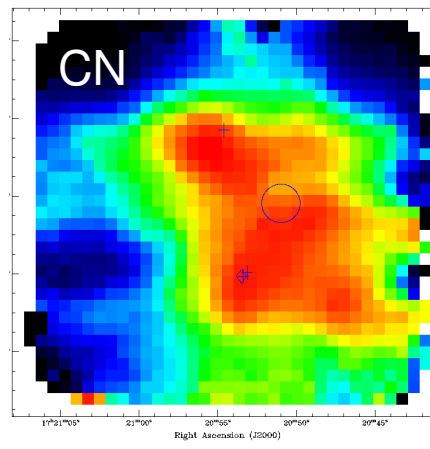
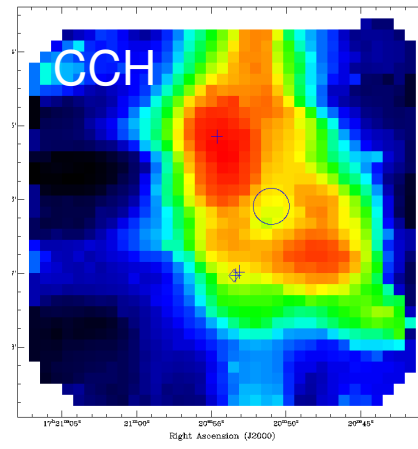
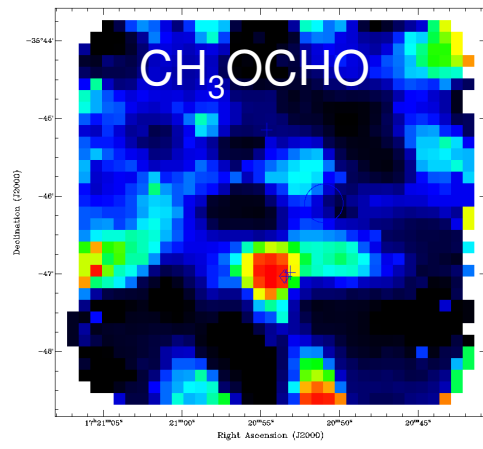
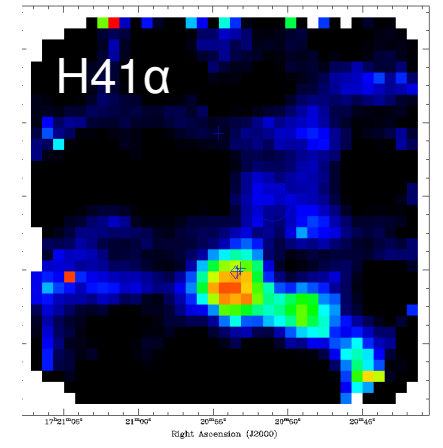
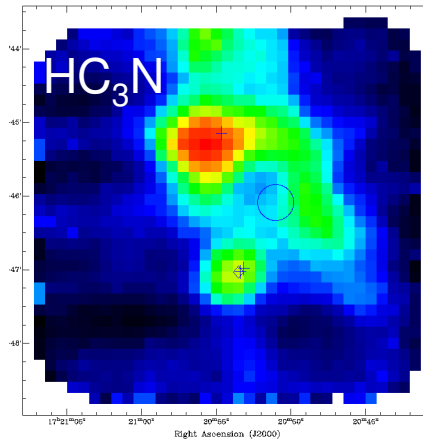
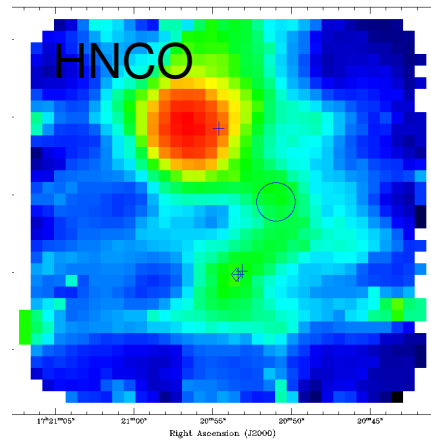
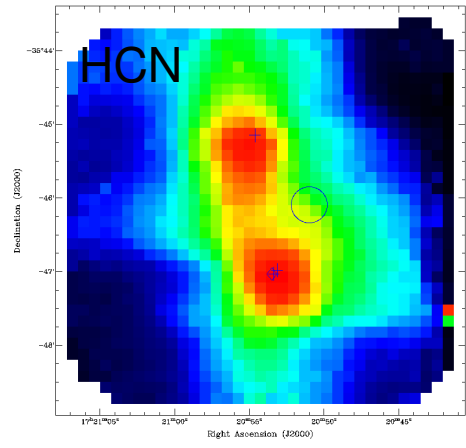


CH₃CN (5-4)



E-type CH_3OH ($5_{-1,5}-4_{0,4}$) Class I maser

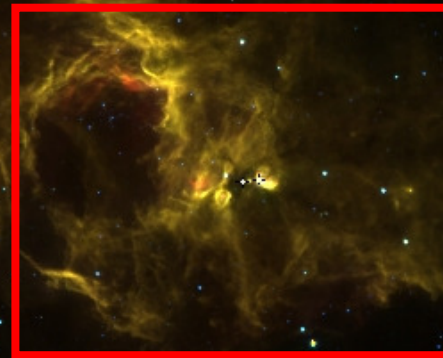




Spitzer 3-colour image

Blue = 4.5 microns
Green = 5.8 microns
Red = 8.0 microns

G305.2+0.2



Declination (J2000)

-62°30'

-40'

-50'

13^h15^m

14^m

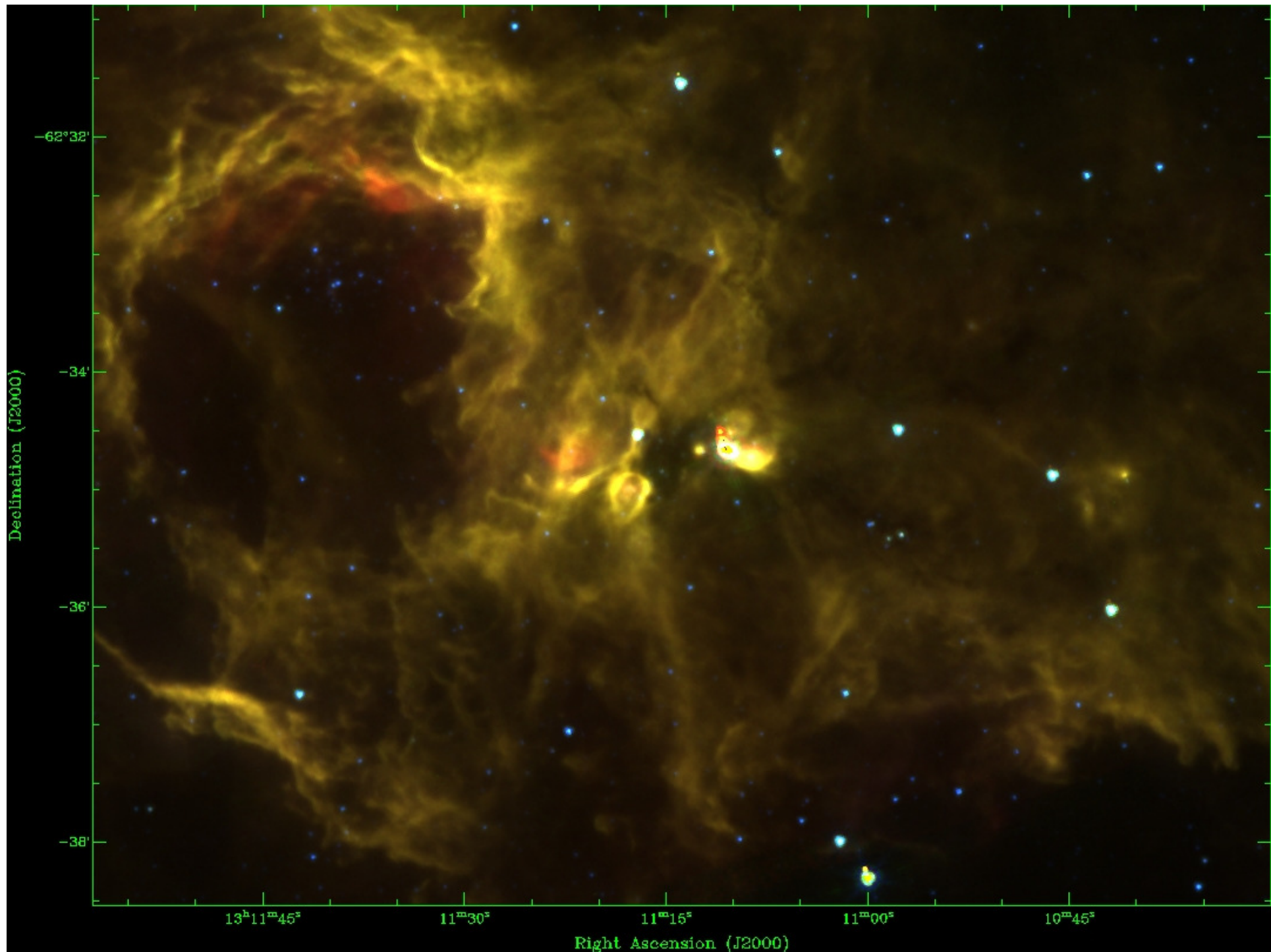
13^m

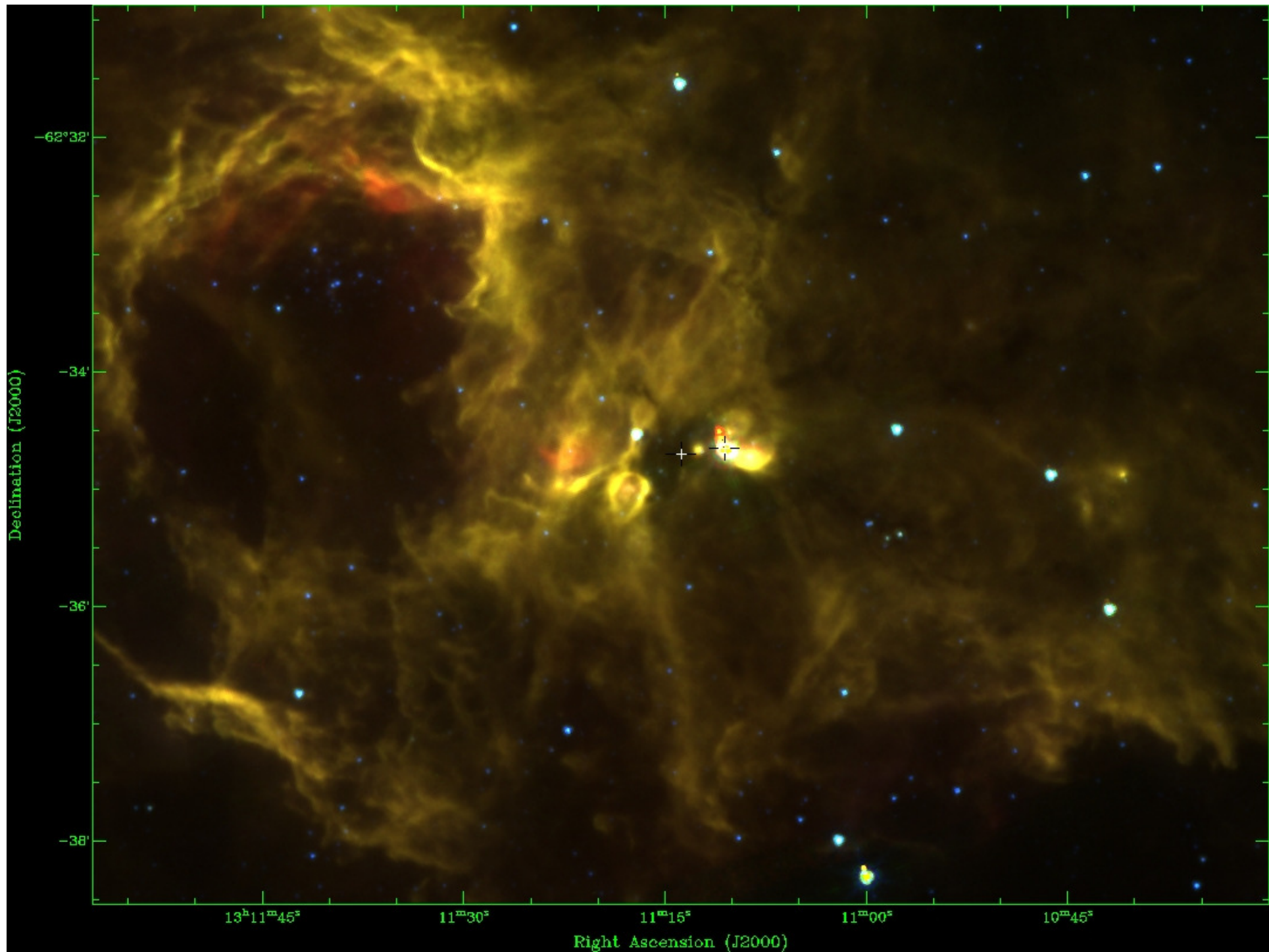
12^m

11^m

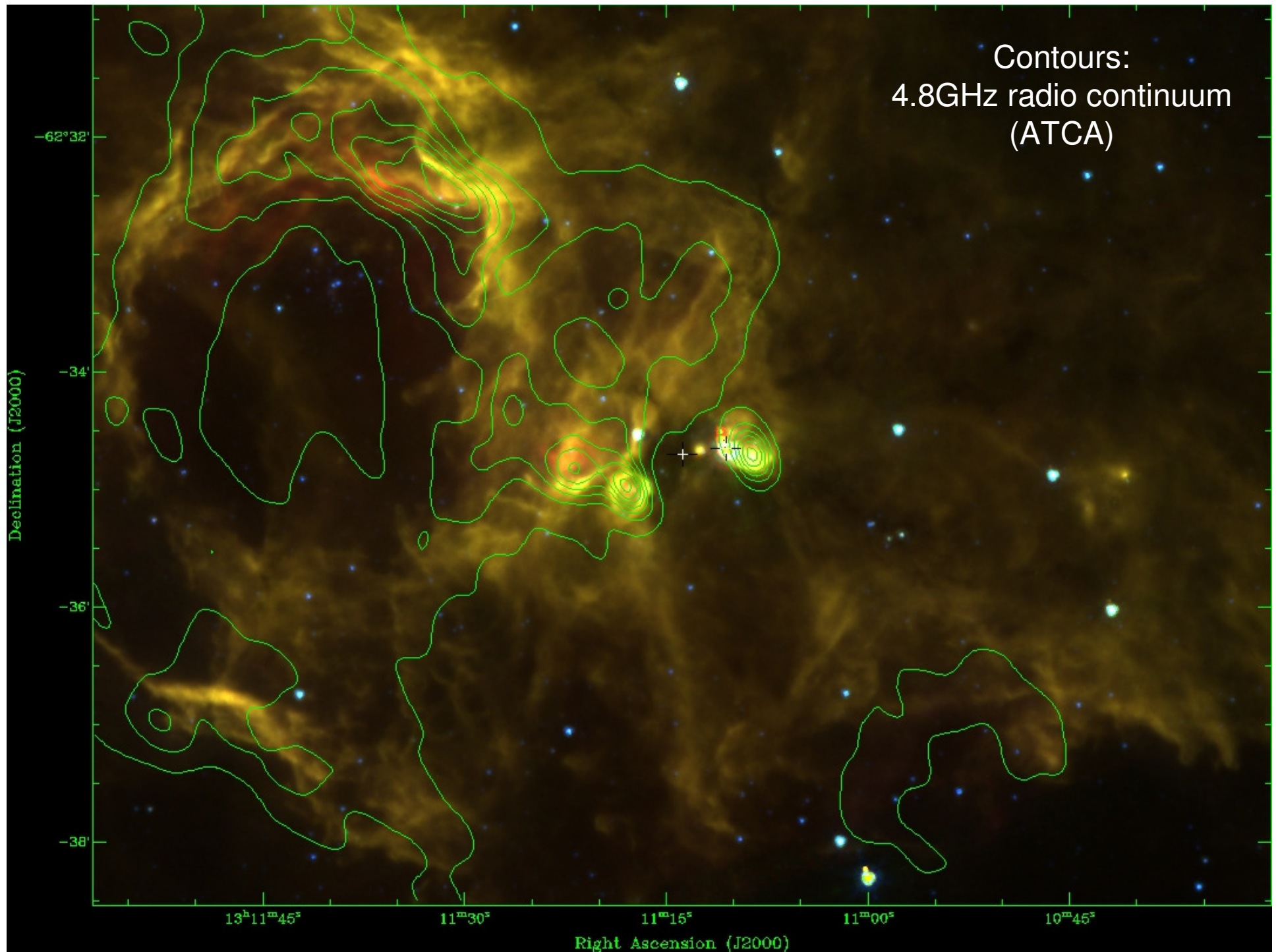
10^m

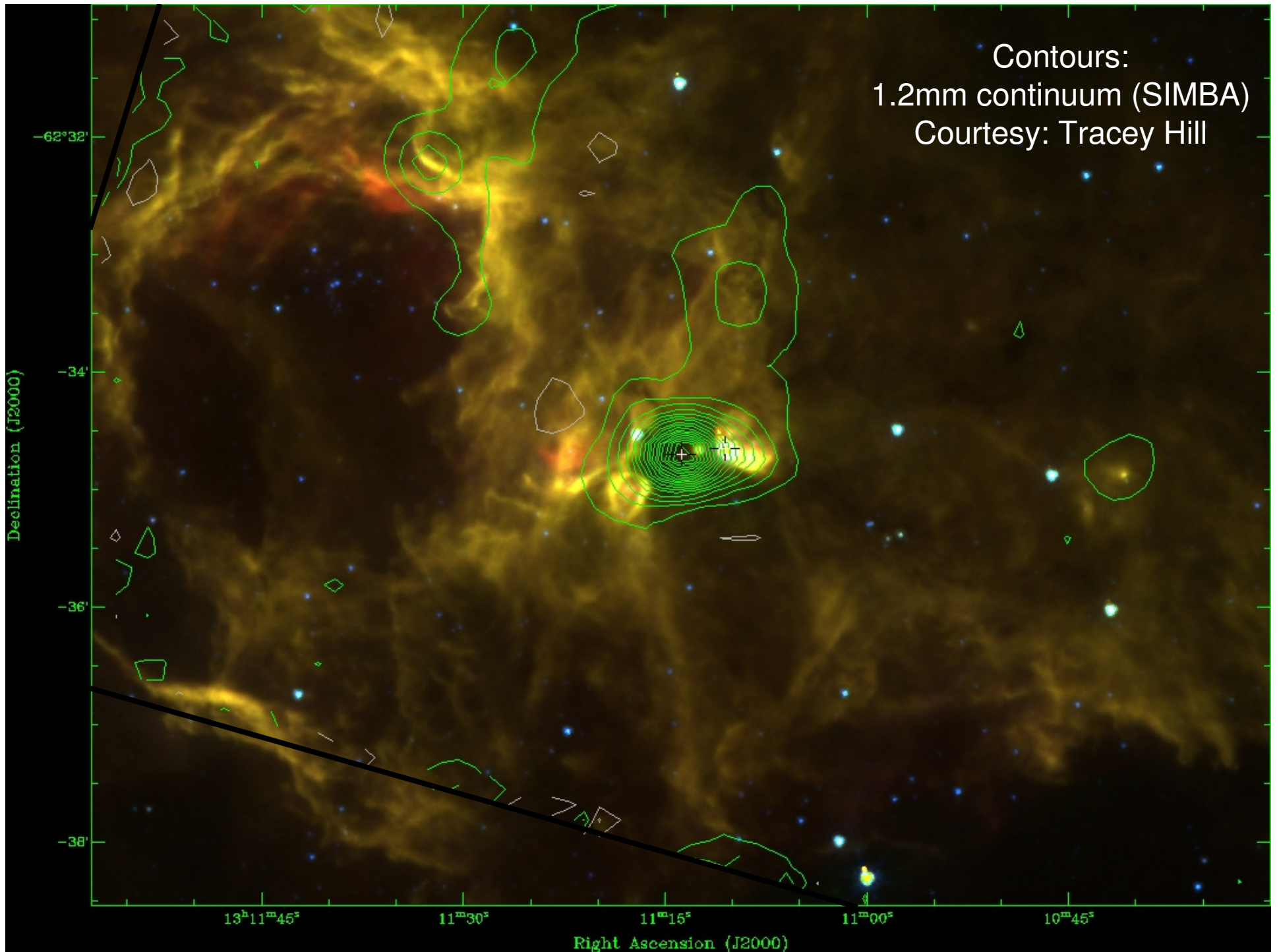
Right Ascension (J2000)





Contours:
4.8GHz radio continuum
(ATCA)

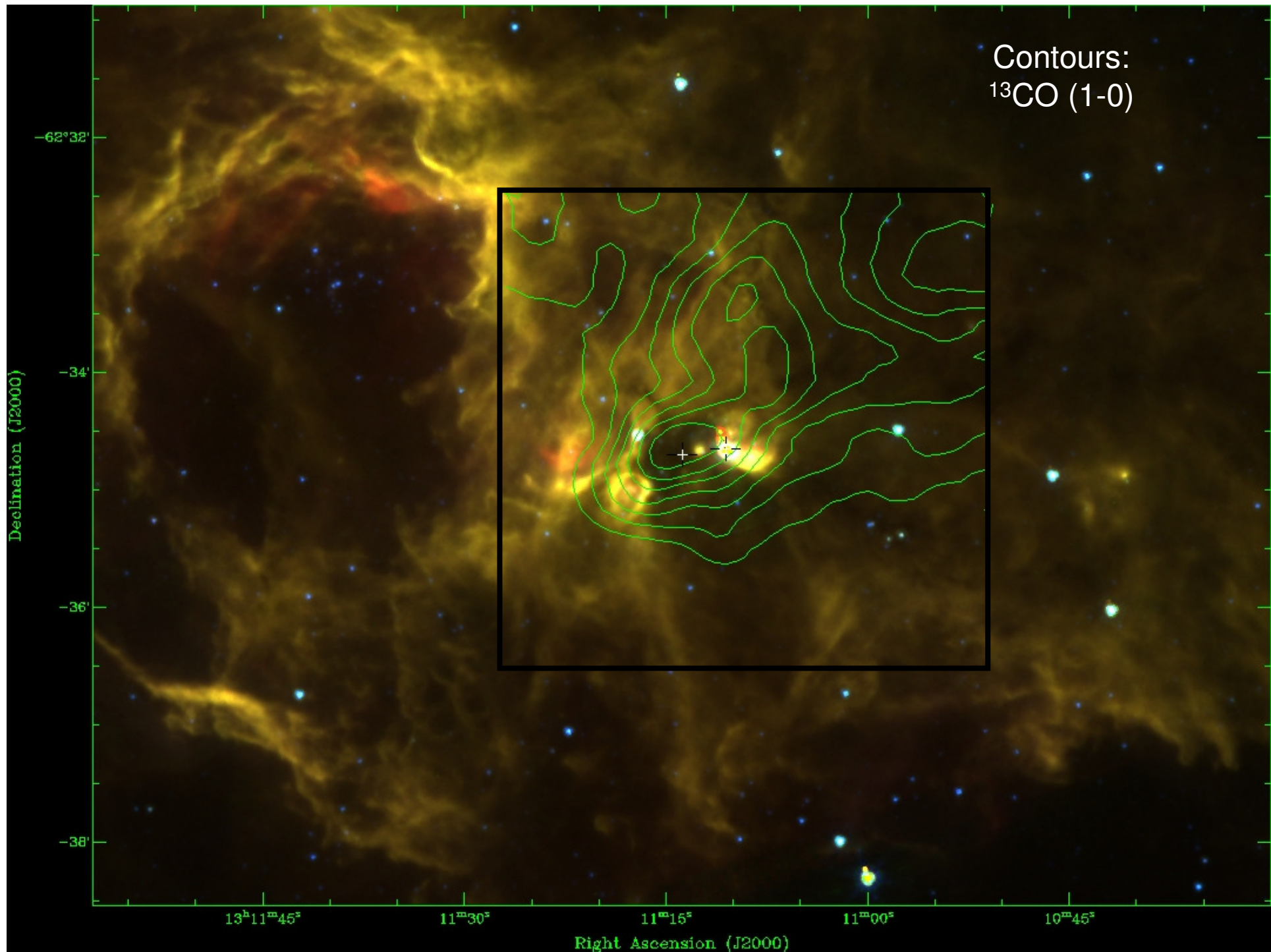


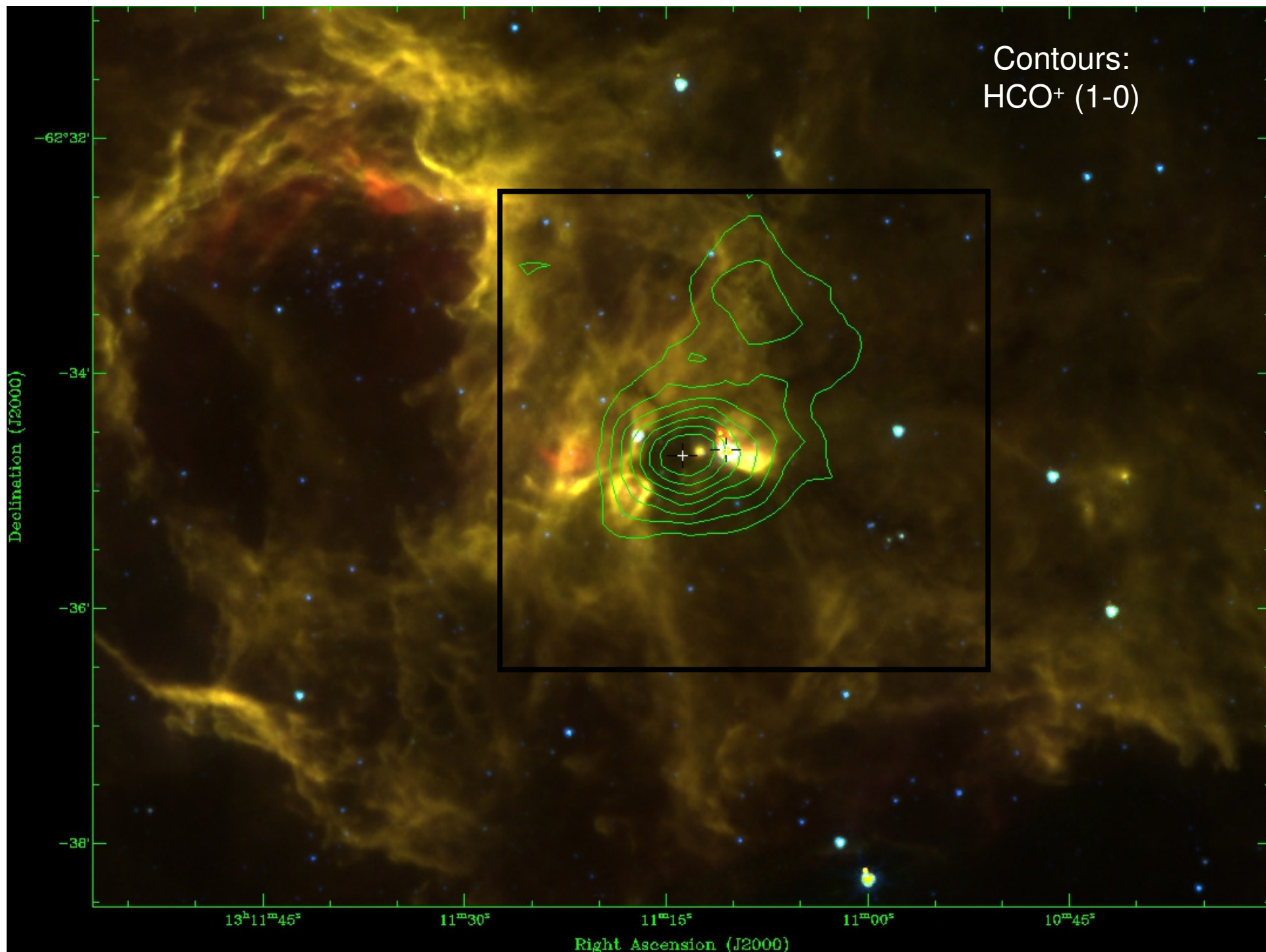


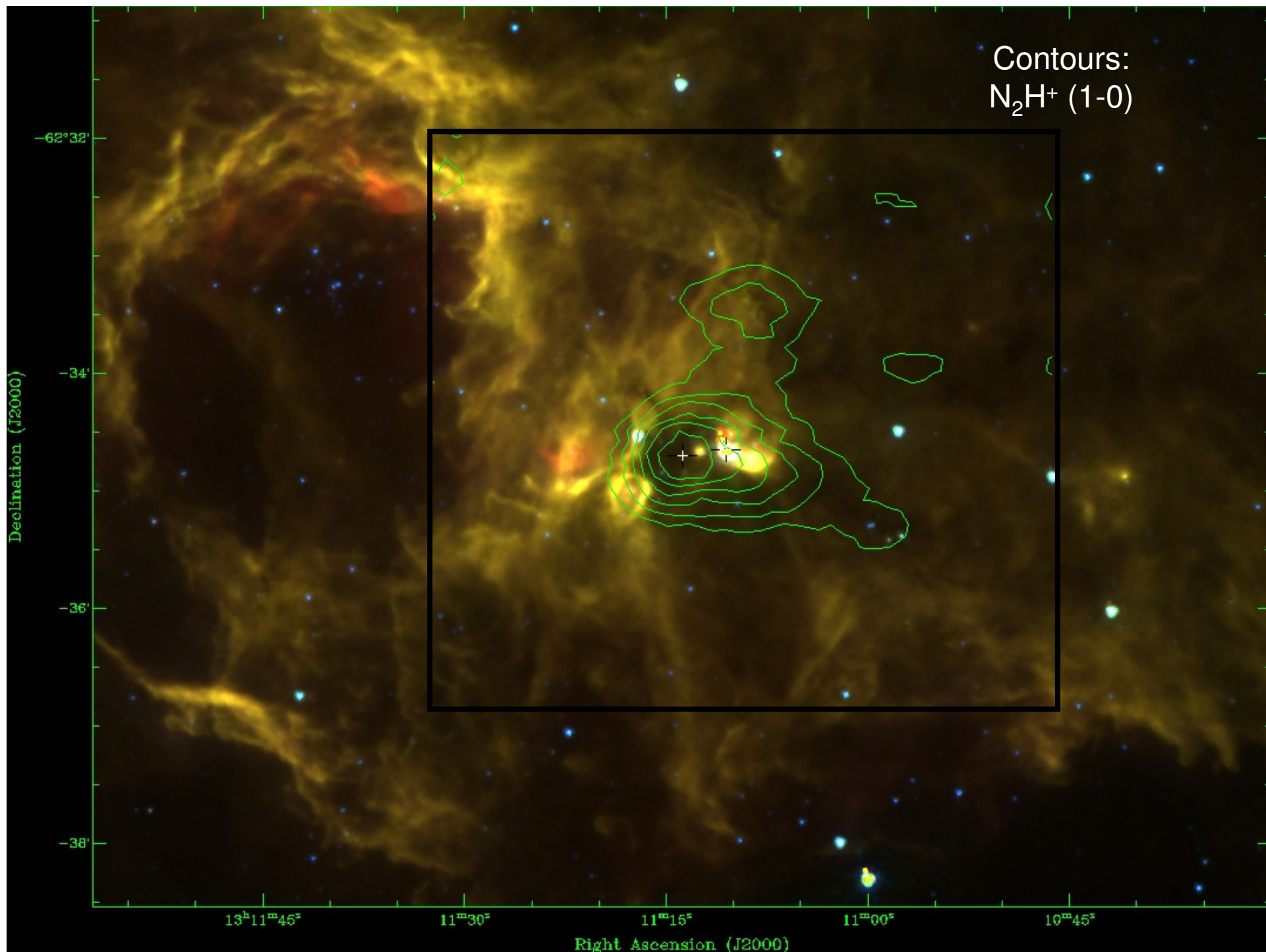
Contours:
1.2mm continuum (SIMBA)
Courtesy: Tracey Hill

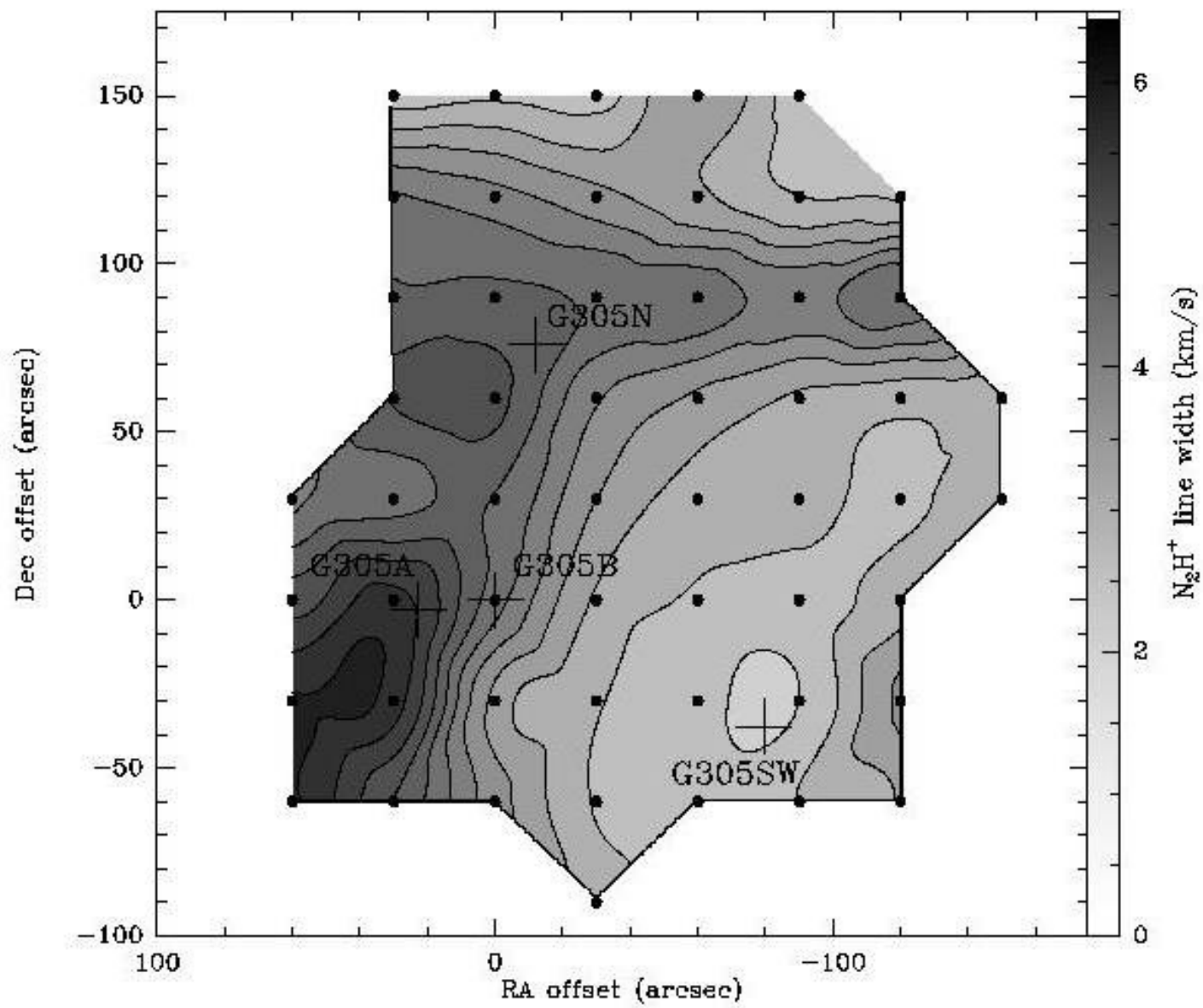
Declination (J2000)

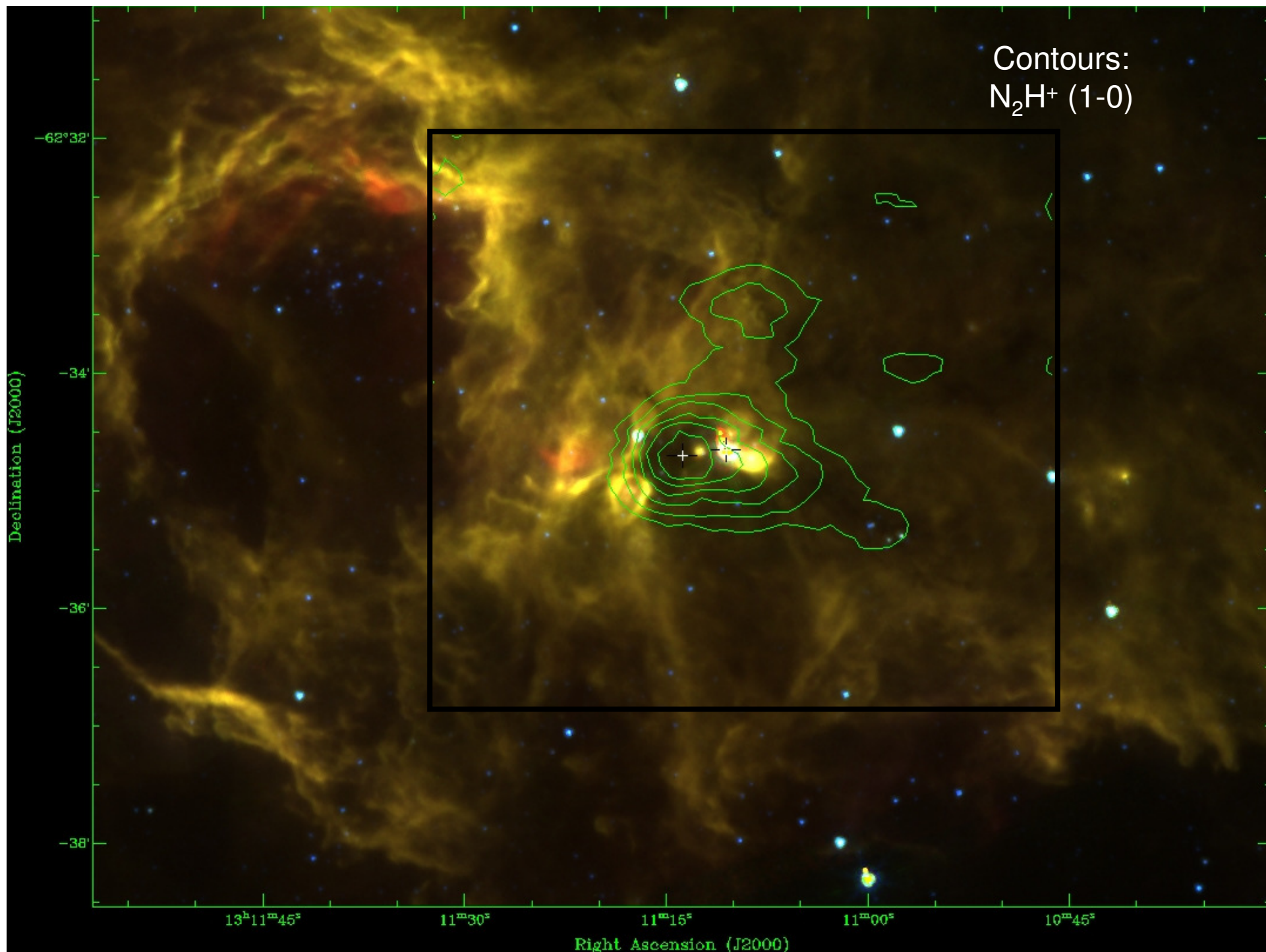
Right Ascension (J2000)











HOPS – H₂O southern Galactic Plane Survey

$l = 300^\circ - 0^\circ - 30^\circ$;
 $-0.5^\circ < b < 0.5^\circ$ (90 square degrees)

Main Target Lines: H₂O masers
NH₃ (1,1), (2,2) and (3,3)
HCCCN (3-2)
Radio recombination lines
CH₃OH thermal + masers
(Class I & II)

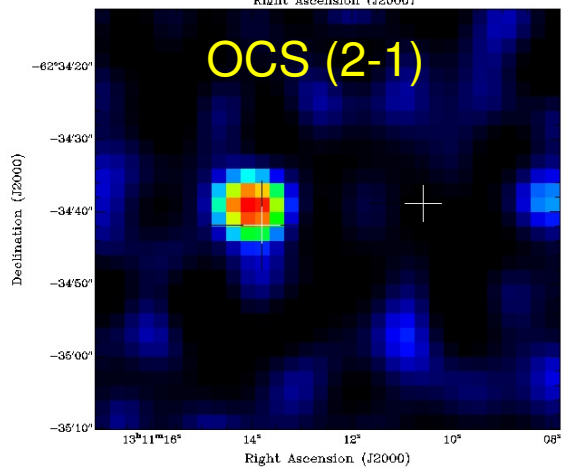
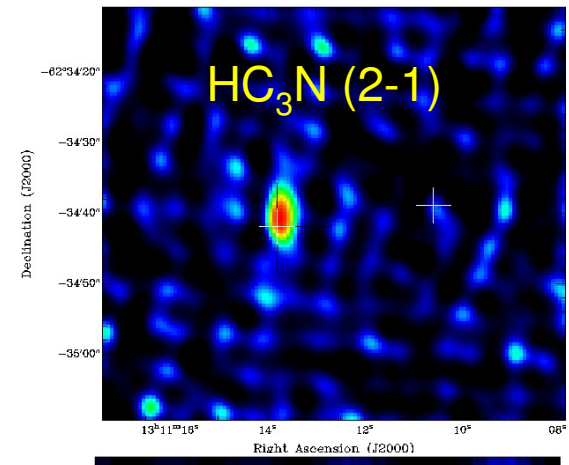
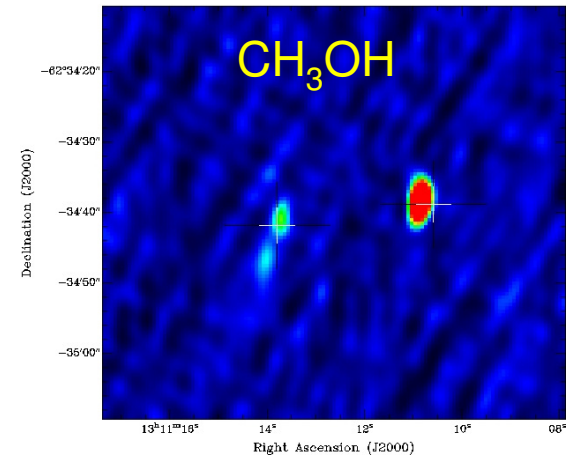
Conclusion

1. Line Surveys of Many Sources
2. Line Survey Maps
3. Mapping Many Spectral Lines on a Galaxy-wide Scale

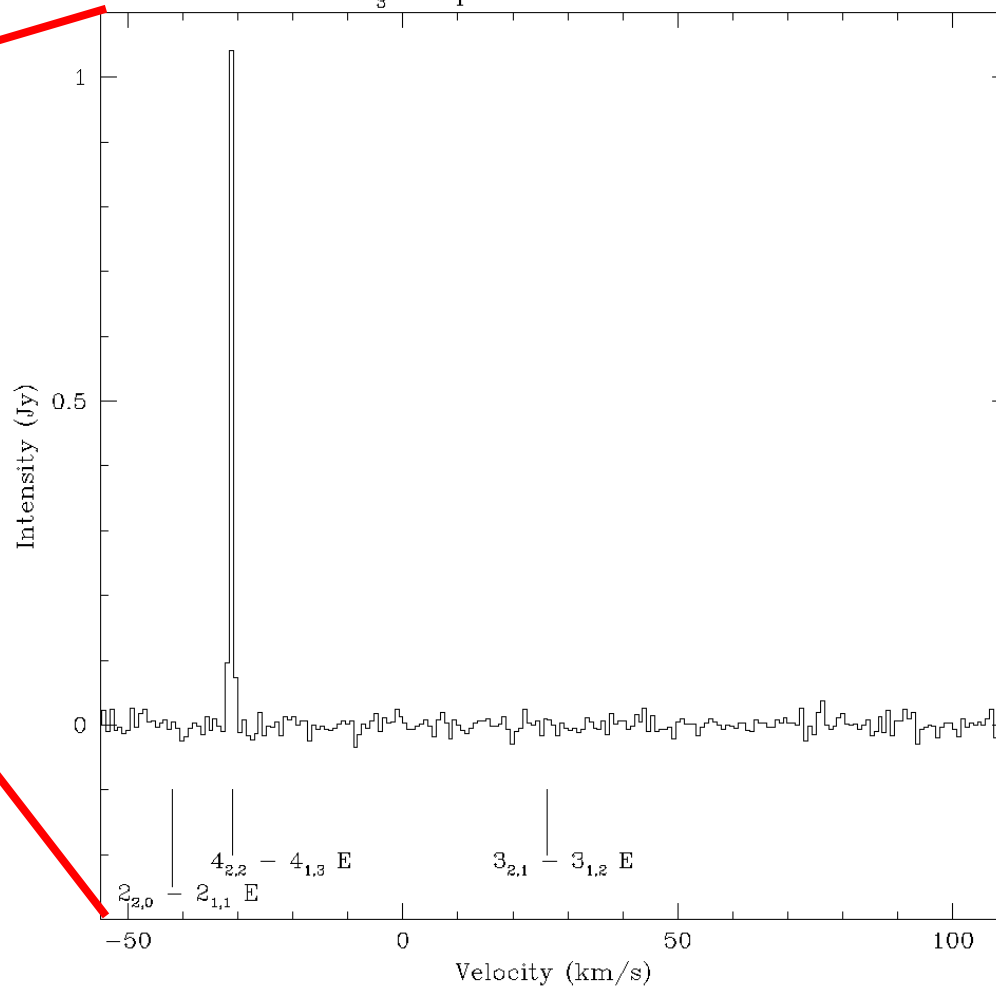
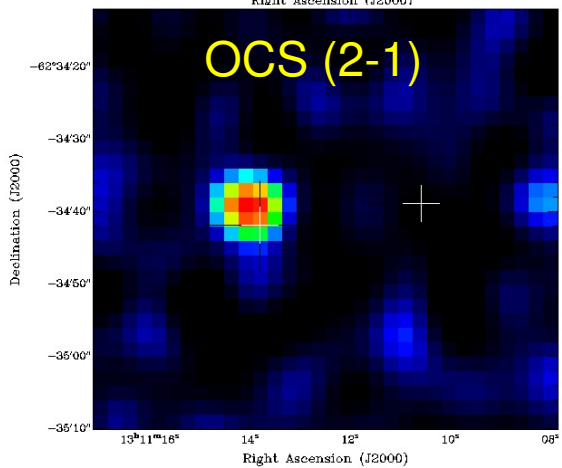
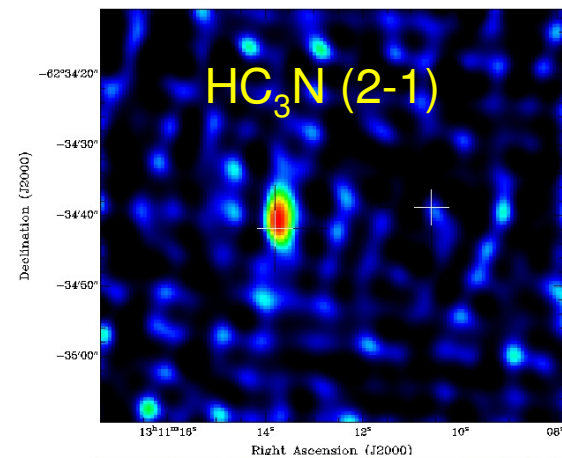
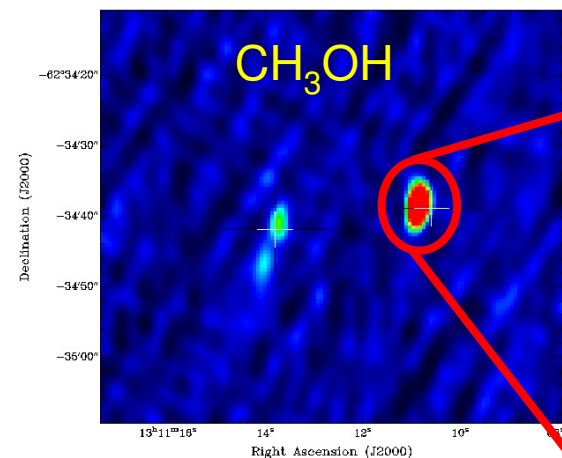
Thankyou!

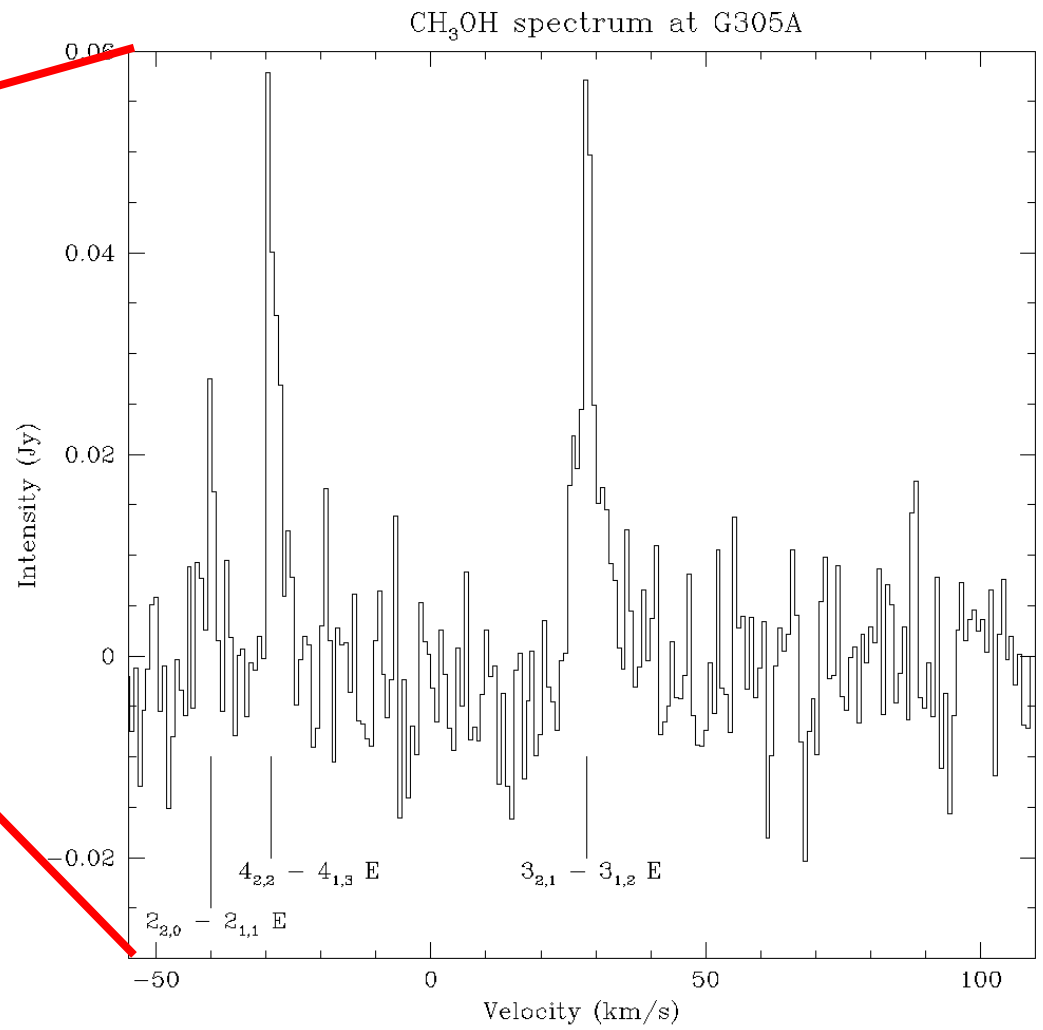
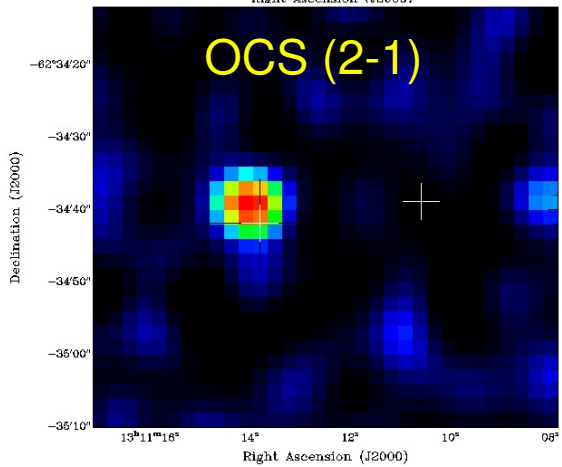
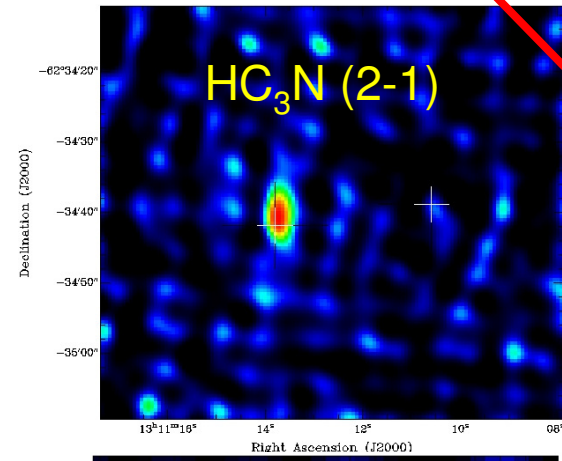
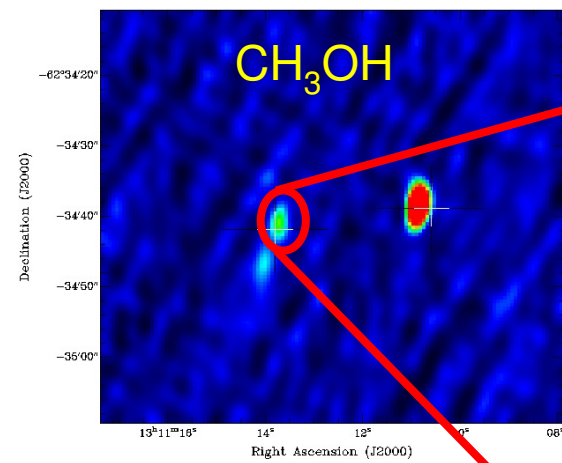
High resolution G305 maps with the ATCA at 12mm



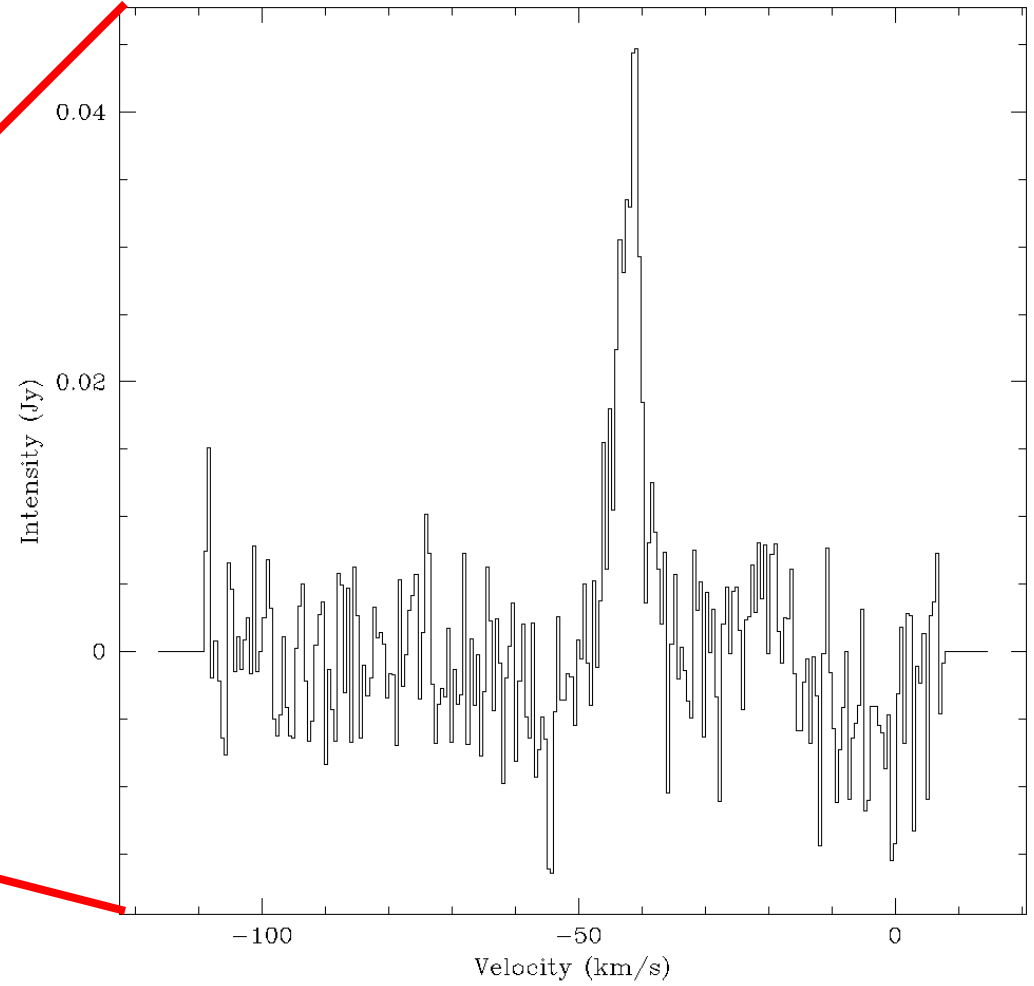
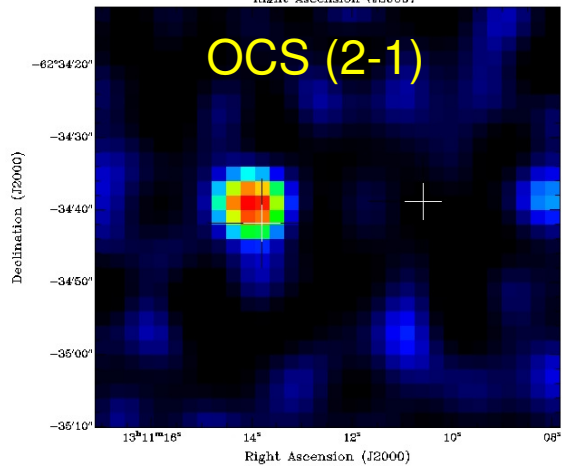
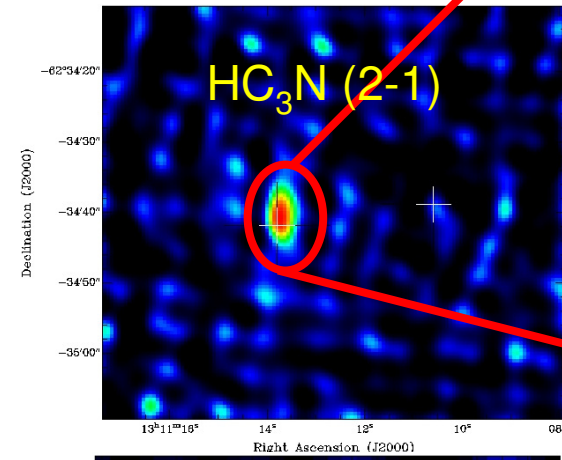
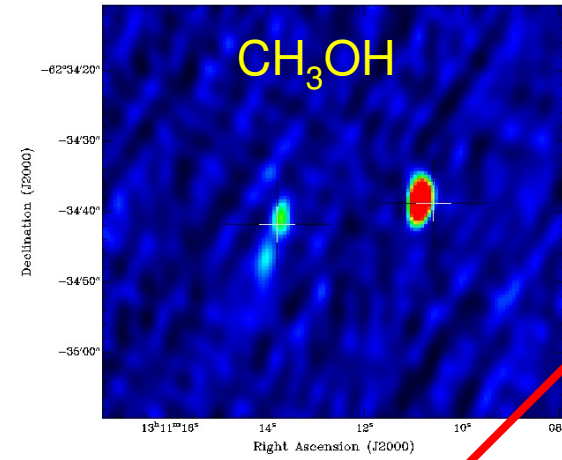


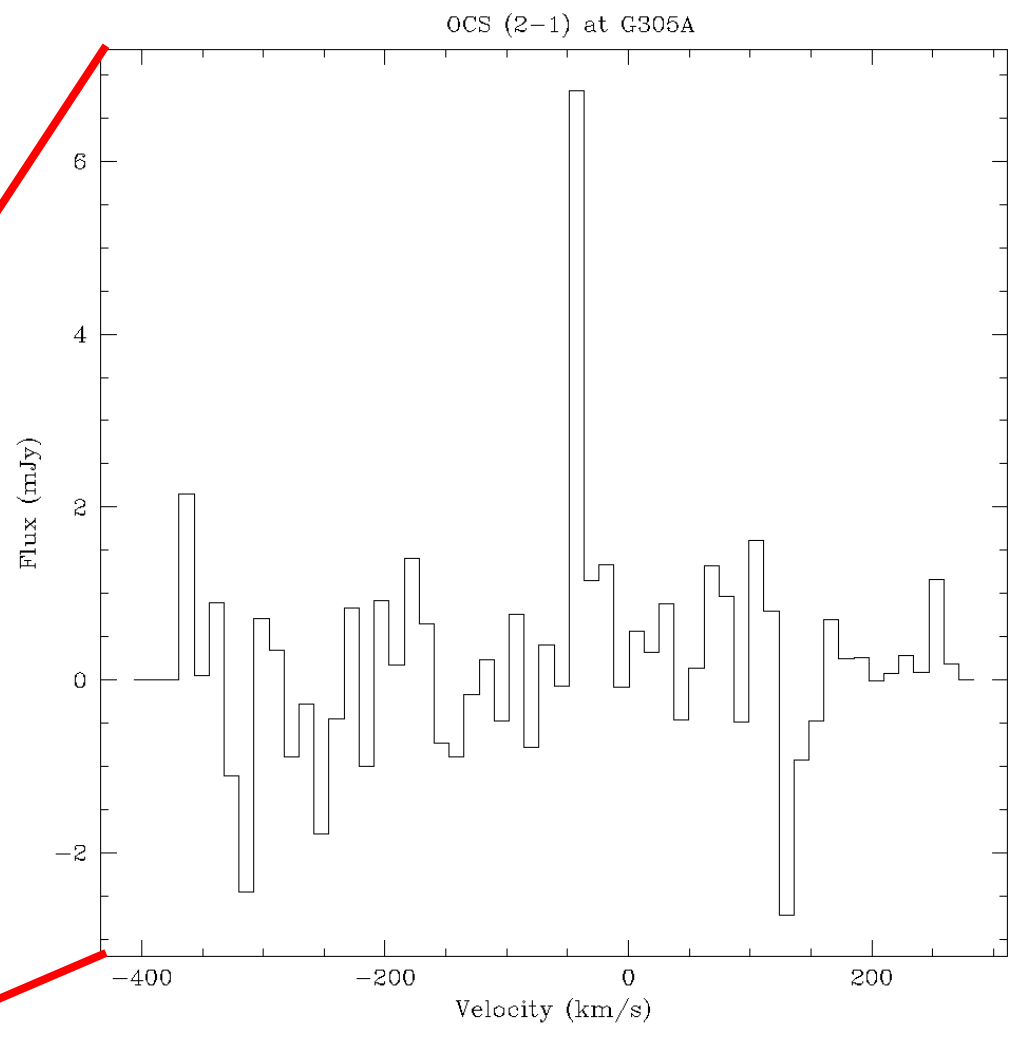
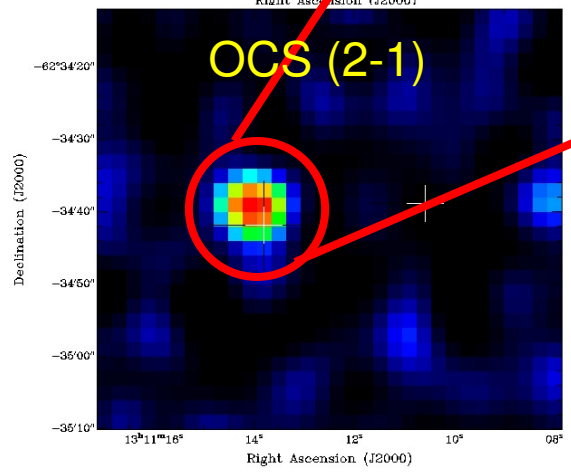
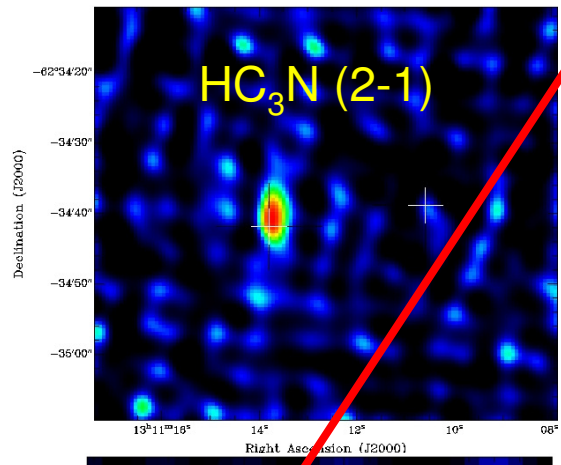
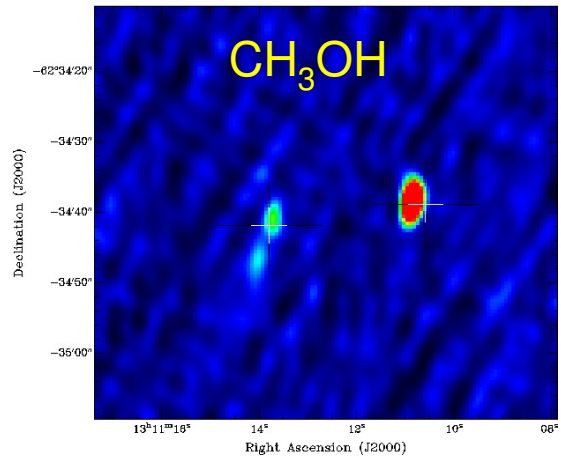
CH₃OH spectrum at G305B

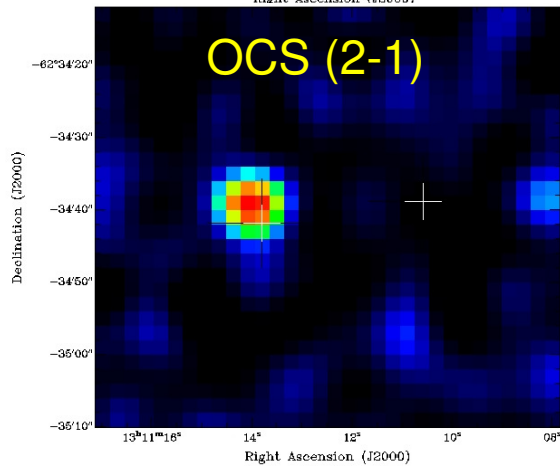
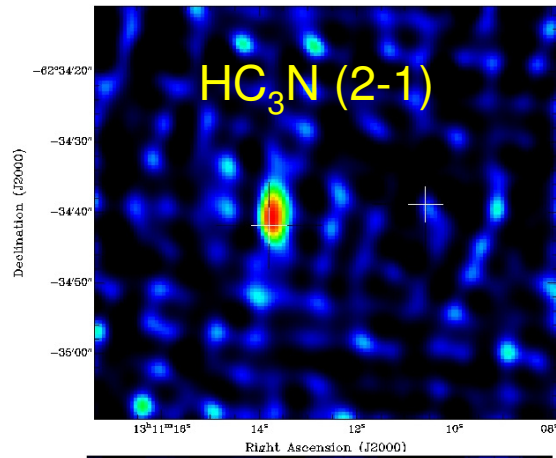
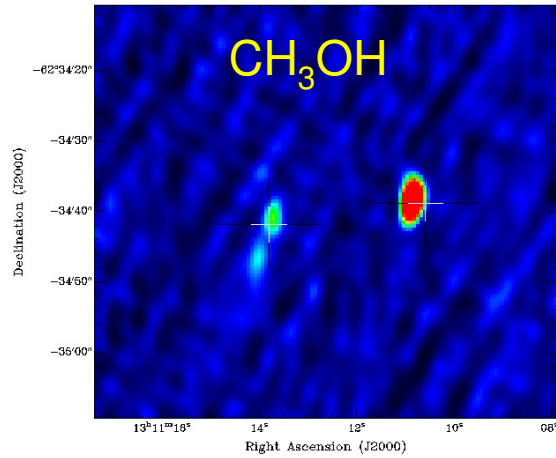




HC₃N spectrum at G305A







NH₃ (1,1), (2,2) and (4,4)
Emission detected at G305A
By Longmore et al. (in preparation)

