



SPLASH

The Southern Parkes Large-Area Survey in Hydroxyl

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(on behalf of the SPLASH team)



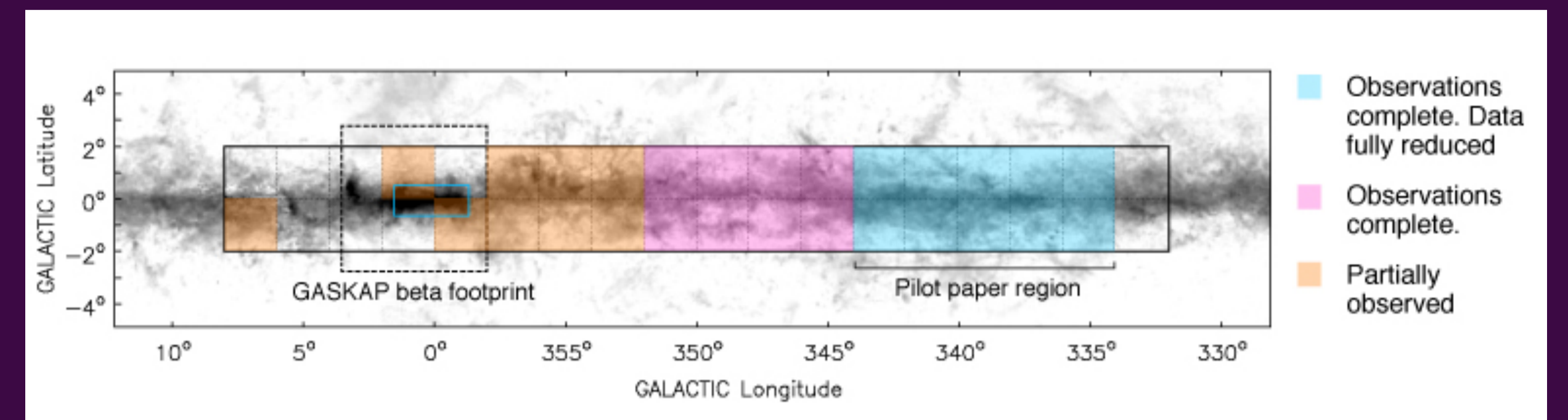
Introduction

SPLASH is a survey of all four ground-state transitions of OH (1612, 1665, 1667 and 1720 MHz). It is a high sensitivity, fully sampled, large scale survey, requiring about 1800 hours over 2.5 years on the Parkes radio telescope.

Our aims:

- Investigate diffuse OH in the density regime between CO and HI (the formation of molecular clouds)
- Constrain quantities like T_{ex} and optical depth by comparing emission/absorption in multiple transitions
- Untargeted OH maser survey to identify flux limited population – star formation, evolved stars and SNRs
- Compare OH masers to other maser species – determine an evolutionary sequence of star formation
- Sister survey to GASKAP

Survey Specs



Area: l: 333° – 0° – 7°; b: within 2° of the Galactic Plane
 Spatial Resolution: 14 arcminutes (Followup of masers with ATCA ~10 arcseconds)
 Spectral Resolution: 0.18 km/s at 1612 MHz, 0.17 km/s at 1720MHz
 Sensitivity: 20 mK per $\delta v = 0.7$ km/s channel (binned)
 Velocity range: -300 to +300 km/s

We have so far completed about 900 hours of observations with Parkes (about half-way) and are on track with regards to both area covered and survey sensitivity.

Results

We detect:

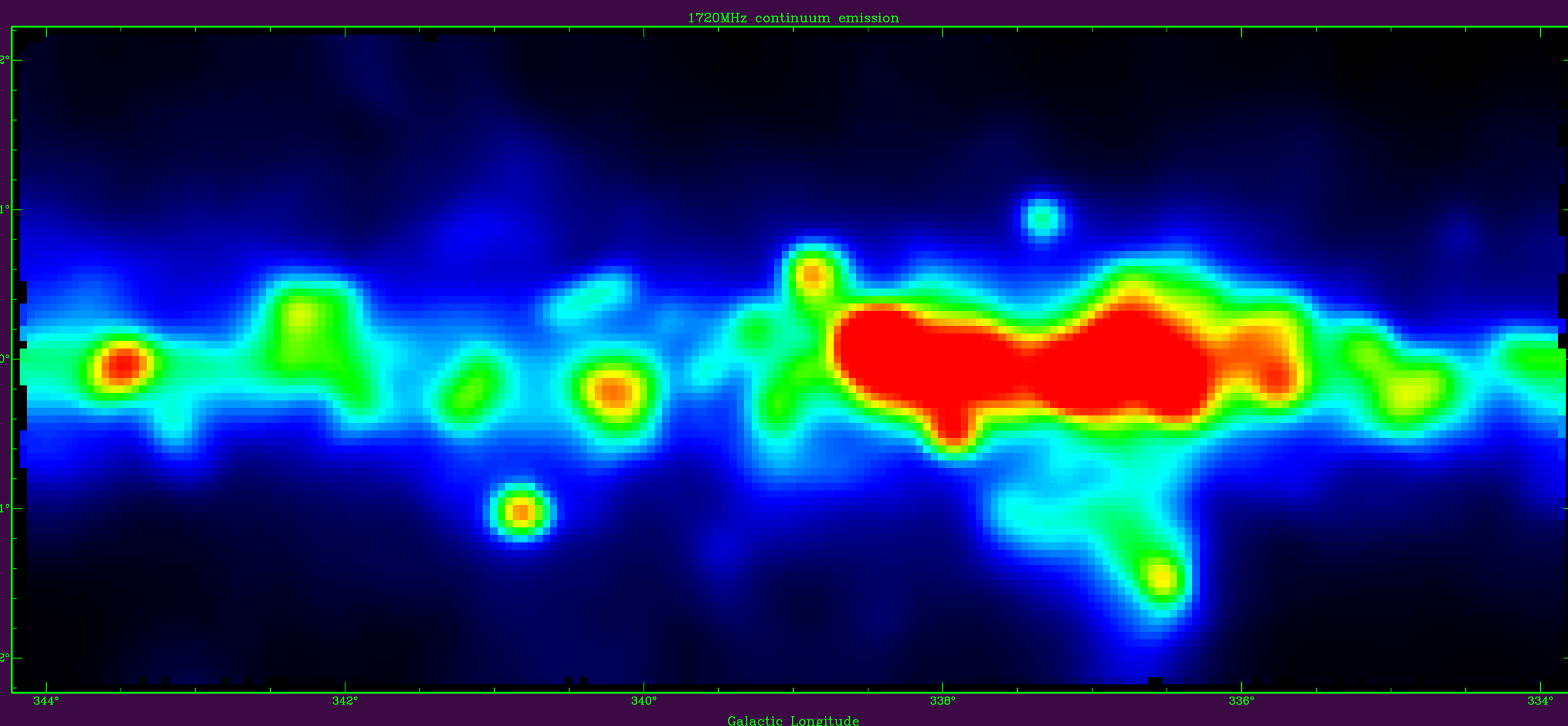
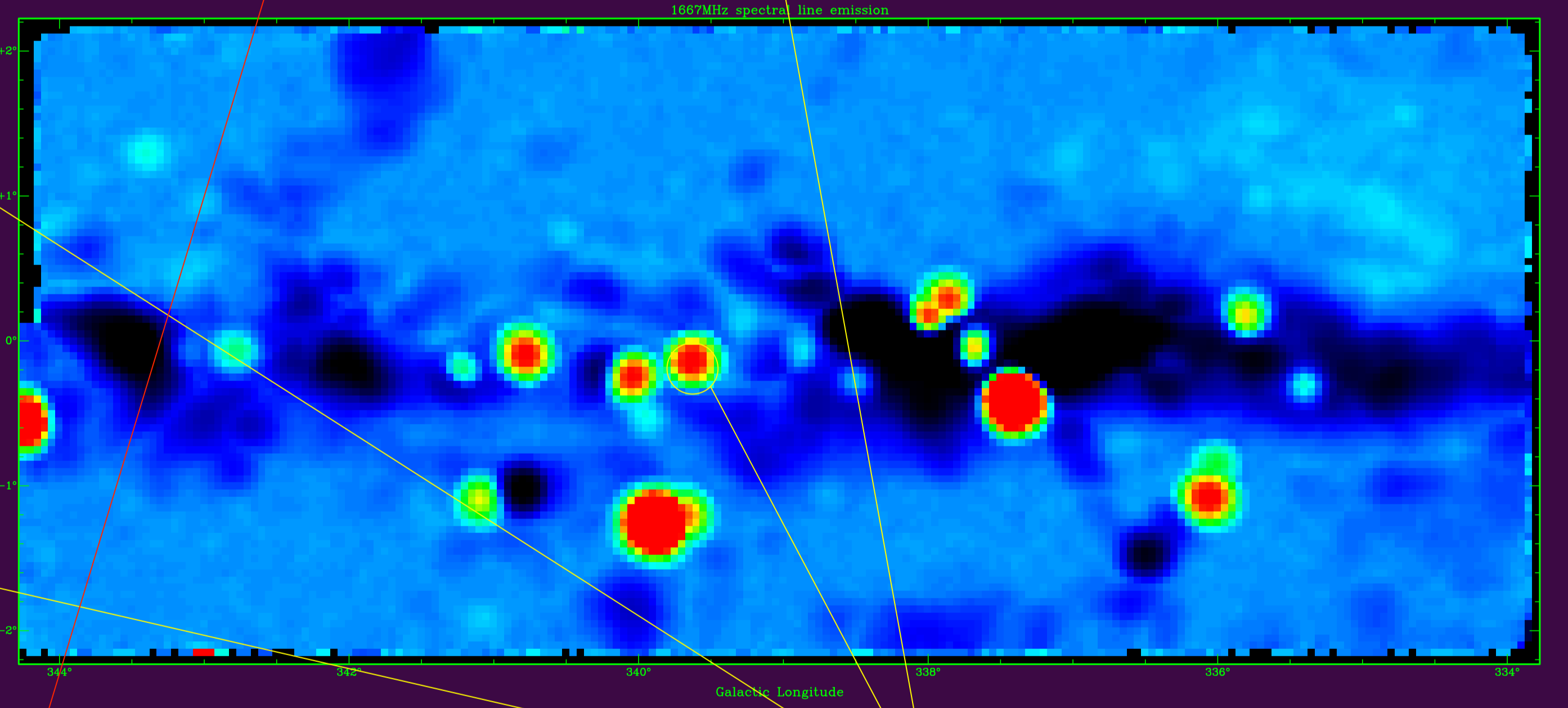
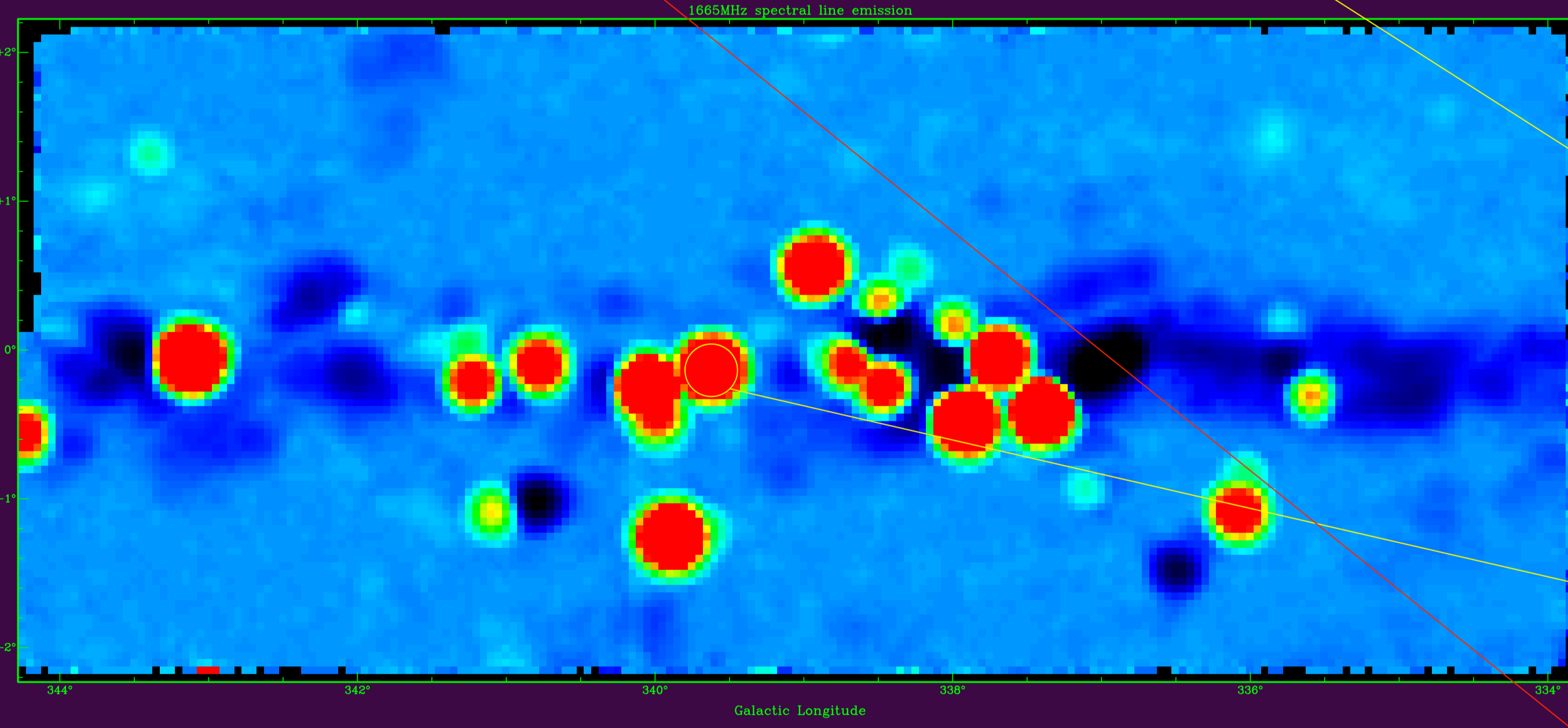
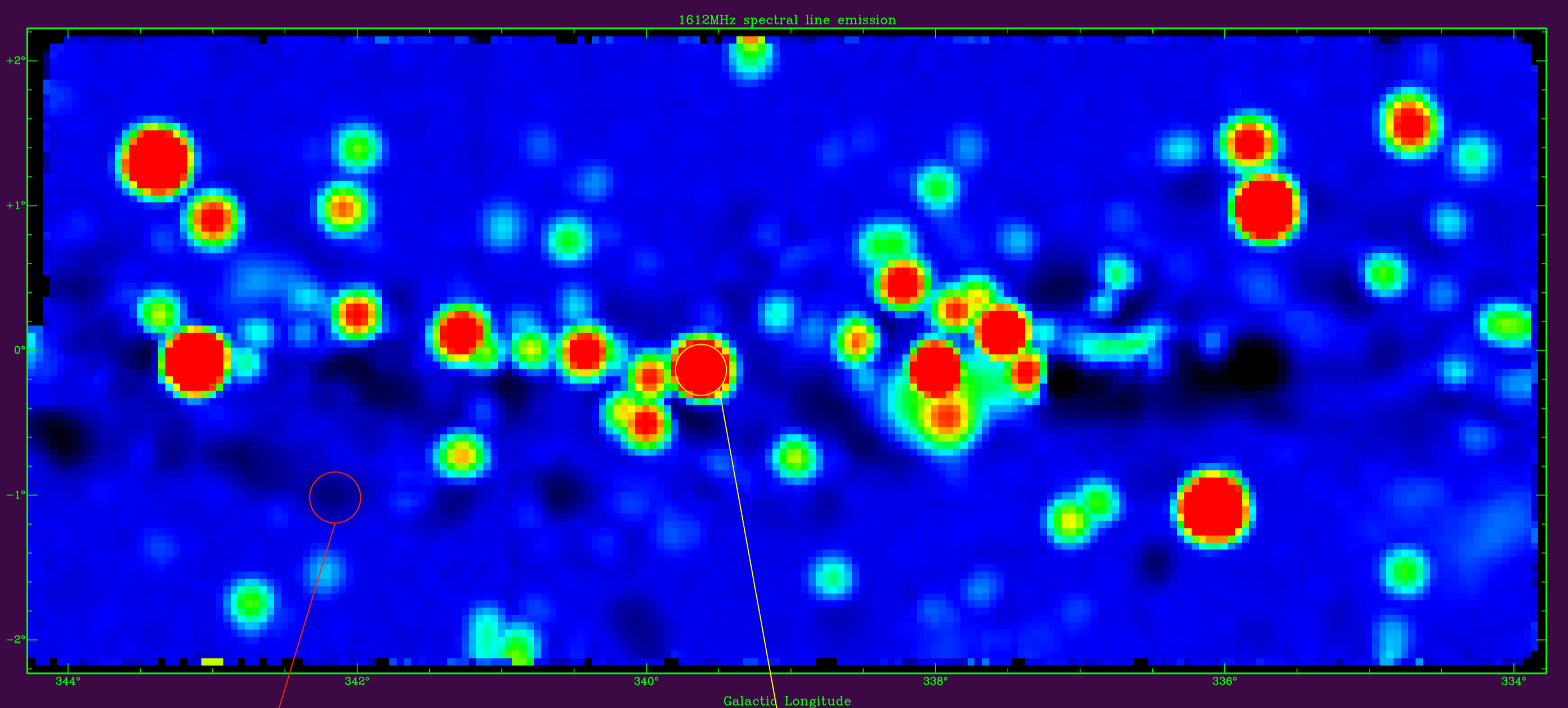
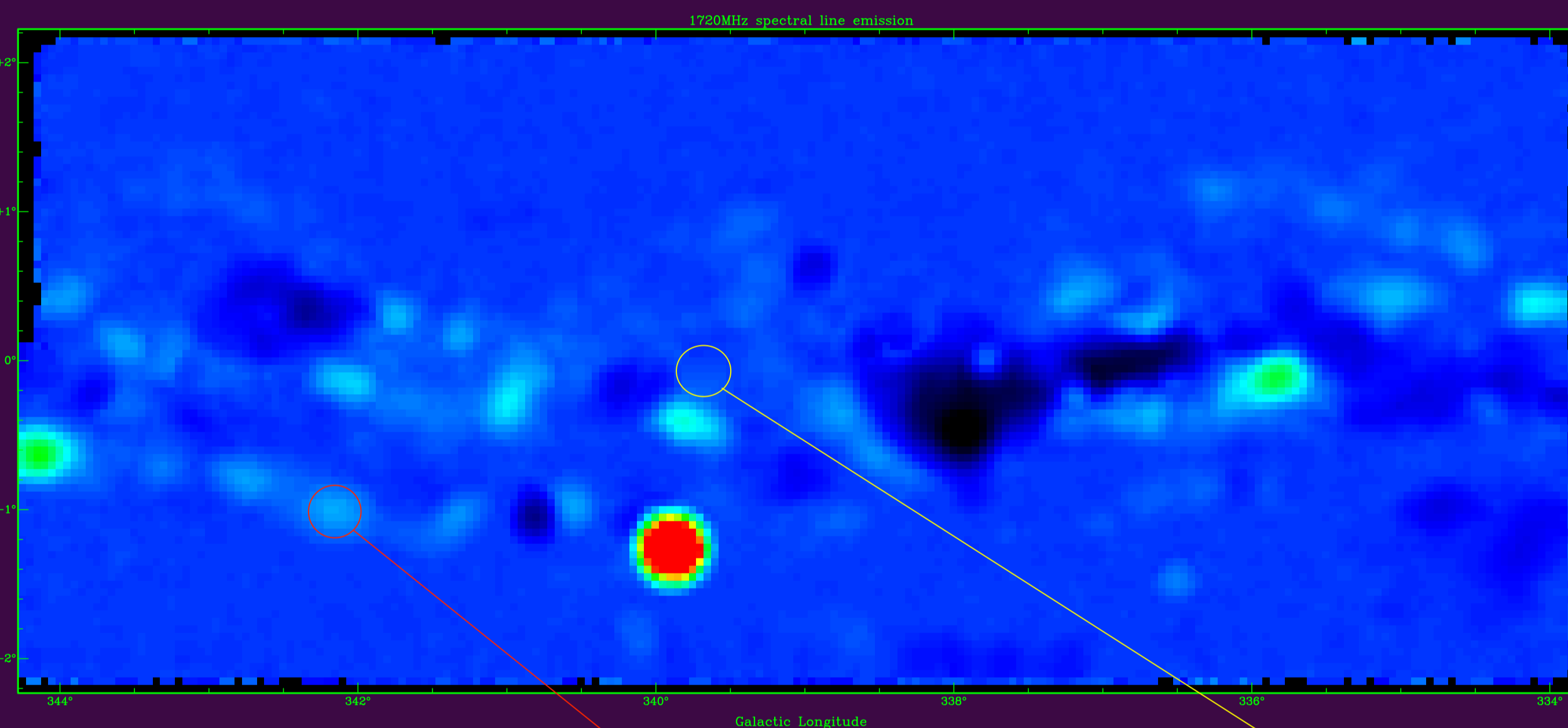
- Widespread OH thermal emission
 - Widespread OH thermal absorption
 - Masers
- In all four OH transitions!

Masers in the pilot region

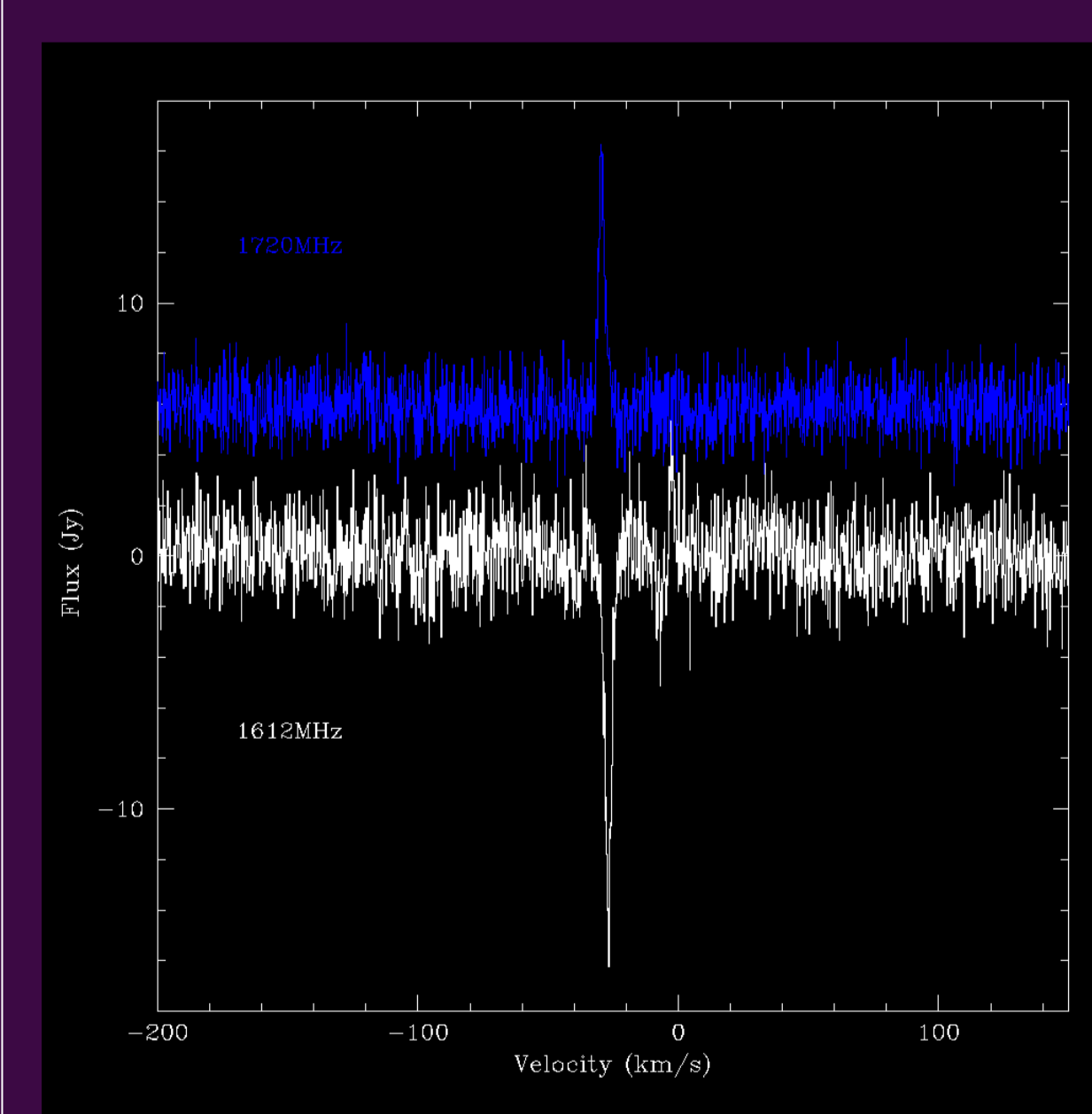
105 1612MHz masers
 47 1665MHz masers
 52 1667MHz masers
 9 1720MHz masers
 32% new detections

These are not moment maps

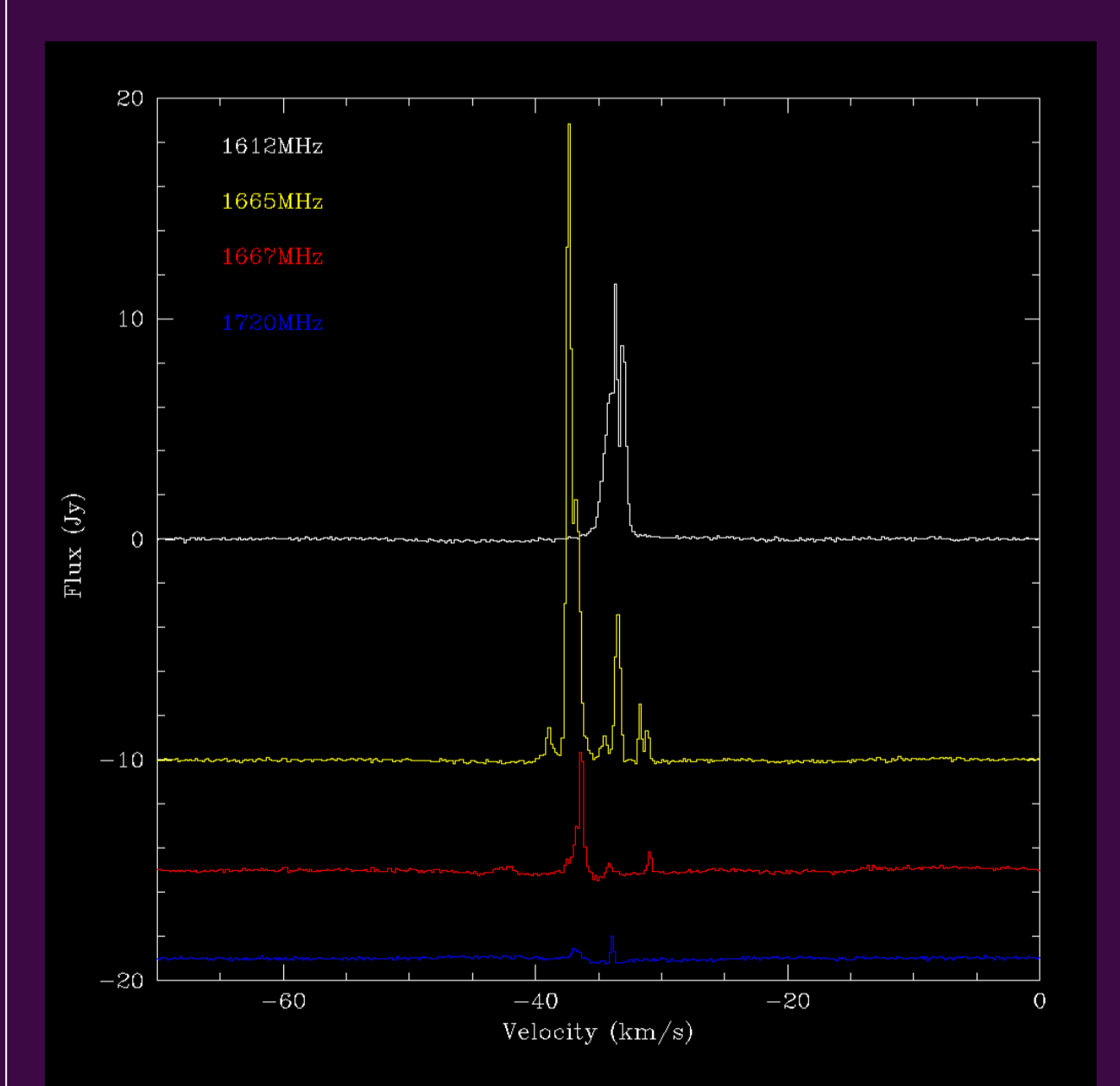
The four maps you see below show the distribution of emission (red/yellow) and absorption (dark blue/black) for the four spectral line data cubes. These maps are made in a two-stage process: 1. A 'peak' temperature map (showing the brightest pixel in the spectrum at each point in the map) and 'trough' temperature map (showing the most absorbed pixel in the spectrum at each point in the map) is made. 2. The peak and trough maps are added together. These maps are useful for showing the full extent over which absorption and emission exist. There is a limitation that the maps cannot clearly show points where both emission and absorption are seen in the same spectrum.



1720MHz continuum map. The above image shows continuum emission, which is seen to extend over the Galactic Plane and to significant distances away from the Galactic Plane. Strong continuum emission corresponds to strong absorption in the spectral line maps shown above.



G342.8-0.8. These spectra show that when the 1612MHz transition is in emission, the 1720MHz transition is in absorption, and vice versa. This is typically what we find, but not always.



G339.6-0.1. Spectra for all four OH transitions are shown for this position where there is evidence that each transition shows maser emission.

