



Effelsberg-100m新接收机的相关科学 龚葵



调试MPIFR仪器 特别是Effelsberg-100m新设备

新设备：

- C⁺ band: (4-8 GHz)
- K band: (18-26 GHz)
- Q band: (33-50 GHz)
- L-band (PAF) – 邓新坪 (contact)

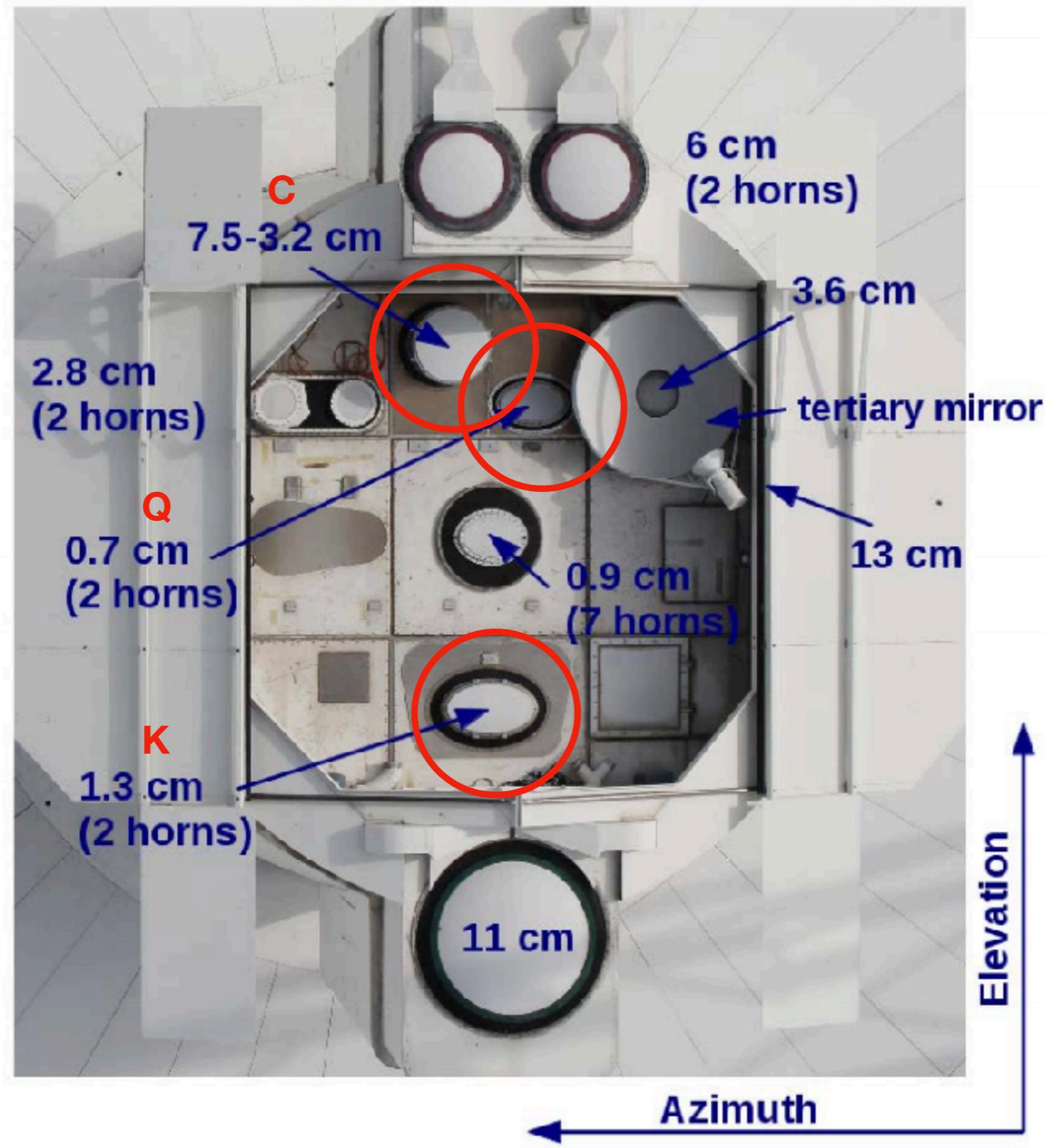
Effelsberg-100m新设备

Secondary focus receivers  Picture							
RX Name	Wavelength [cm]	Frequency (center) [GHz]	Nr. of Horns	Polarization	Comment	Calibration information	Technical information
S130mm	13	2.2-2.3 (2.25)	1	RCP	geo-VLBI	more details	 tech. data
S110mm	11	2.6-2.68 (2.64)	1	LCP/RCP	polarimeter	more details	 tech. data
S60mm Double Beam	6	4.6-5.1 (4.85)	2	LCP/RCP	polarimeter	more details	 tech. data
S45mm	4.5	4.0-9.3 (6.65)	1	H/V	under test	more details	
S36mm	3.6	7.9-9.0 (8.35)	1	LCP/RCP	polarimeter	more details	 tech. data
S28mm Double Beam	2.8	10.3-10.6 (10.45)	2	LCP/RCP	polarimeter	more details	 tech. data
S14mm Double Beam RX	1.3	18.0-26.0 (22.0)	2	LCP/RCP		more details	
S9mm 7-beam	0.9	30.0-34.0 (32.0)	7 (2 usable)	LCP, H/V		more details	 tech. data
S7mm Double Beam RX	0.7	33.0-50.0 (41.5)	2	LCP/RCP	in commissioning	more details	

- L-band (PAF)



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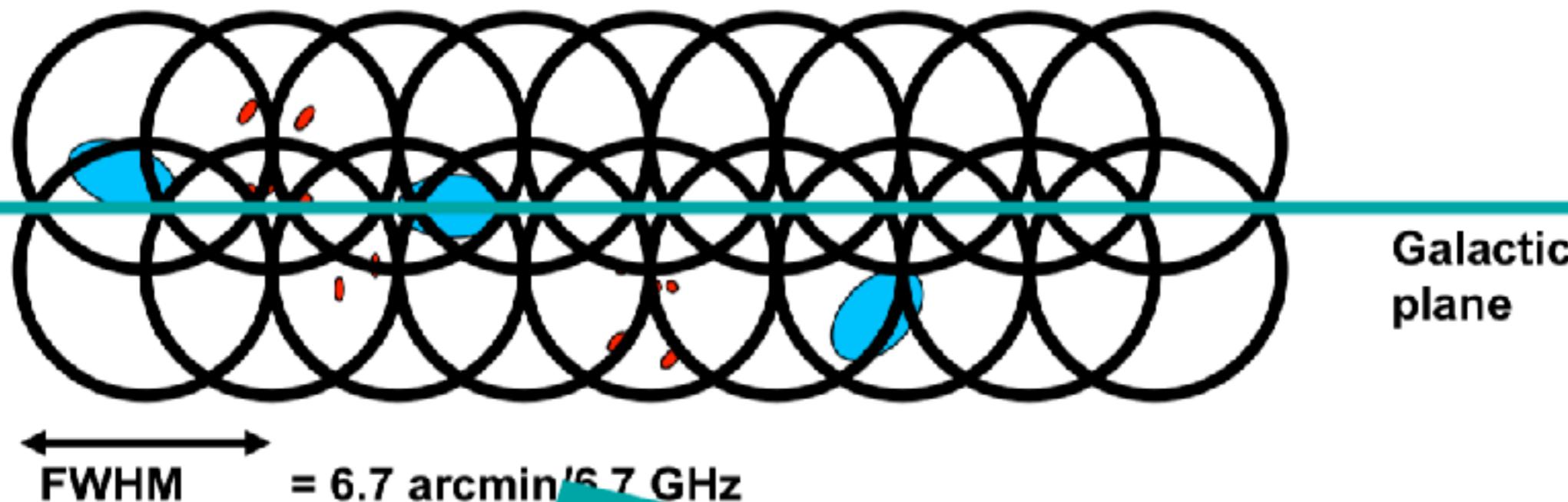


Why C+ band?

**Add large-scale information for the VLA
survey**

A comprehensive star formation survey of the Galactic plane

Menten, Brunthaler++



Radio continuum emission

Full polarization

Band 4 ... 8 GHz → determine

JVLA B + D array + Effelsberg: $\theta_B \sim 2$ arcsec

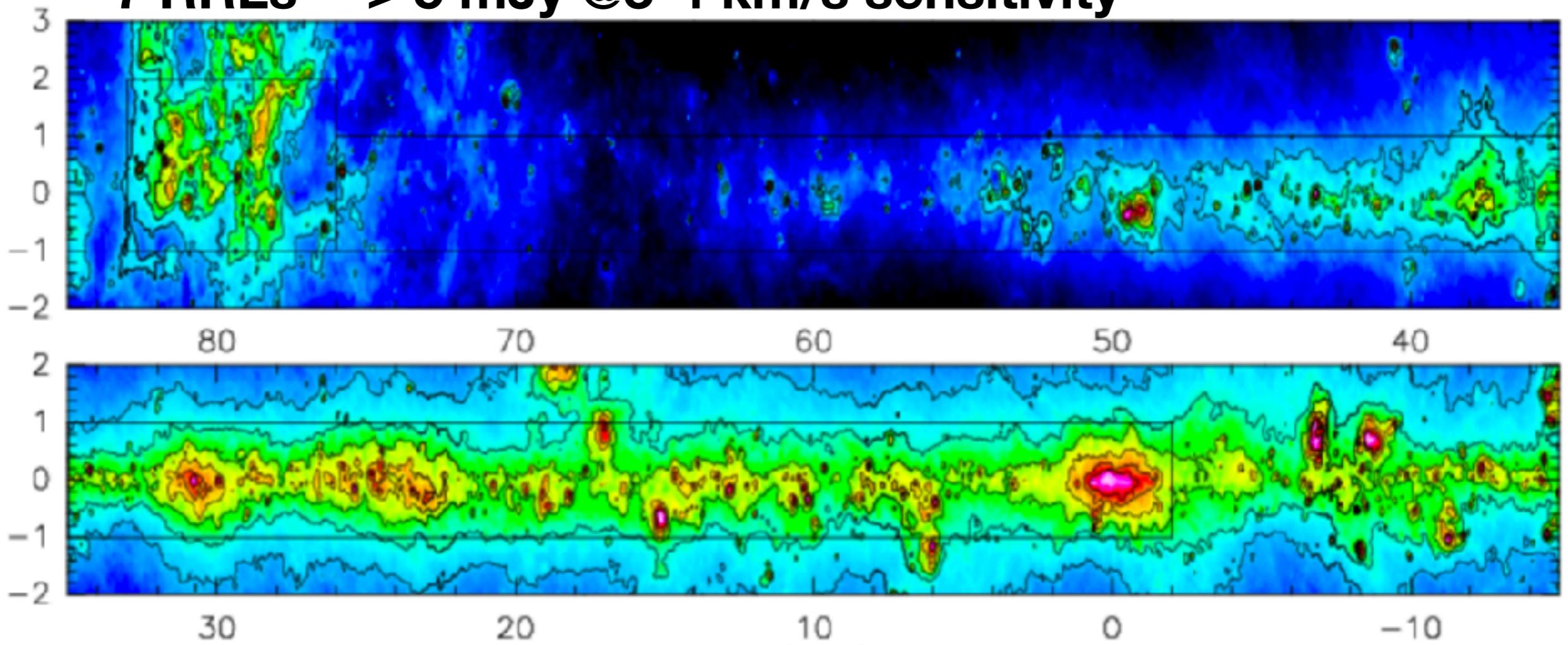
PLUS: Do 6.7 GHz CH_3OH maser,
RRLyrae, 4.8 GHz H_2CO absorption
(+ emission) ... **SIMULTANEOUSLY!**

GLOSTAR

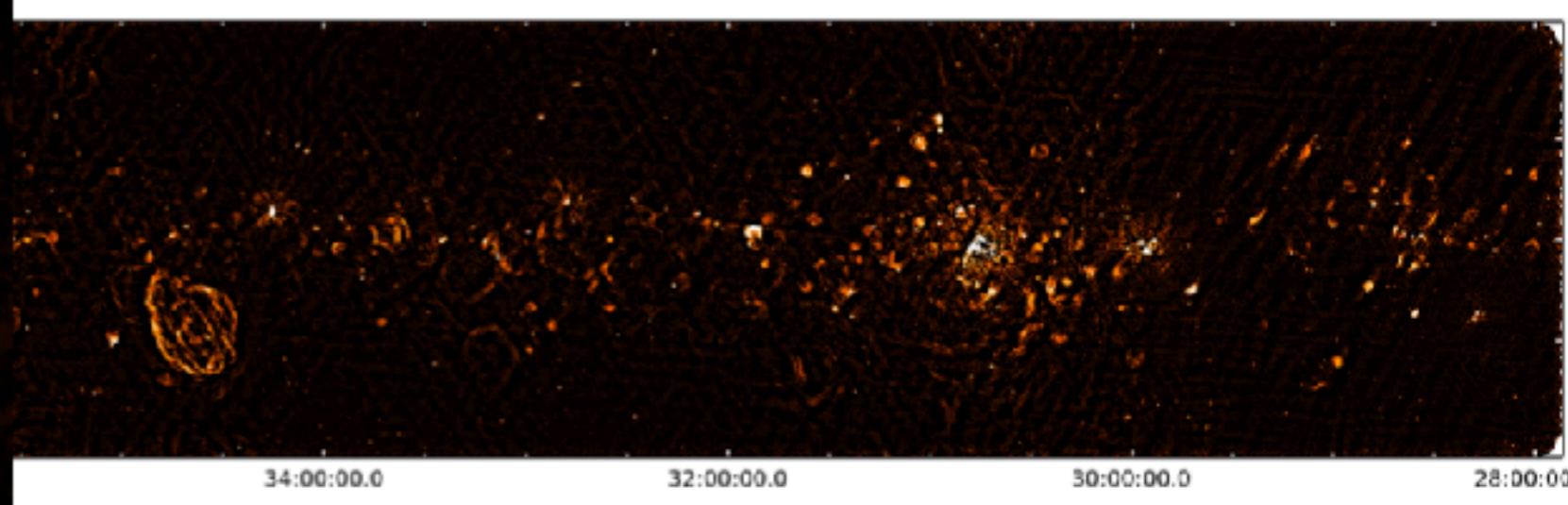
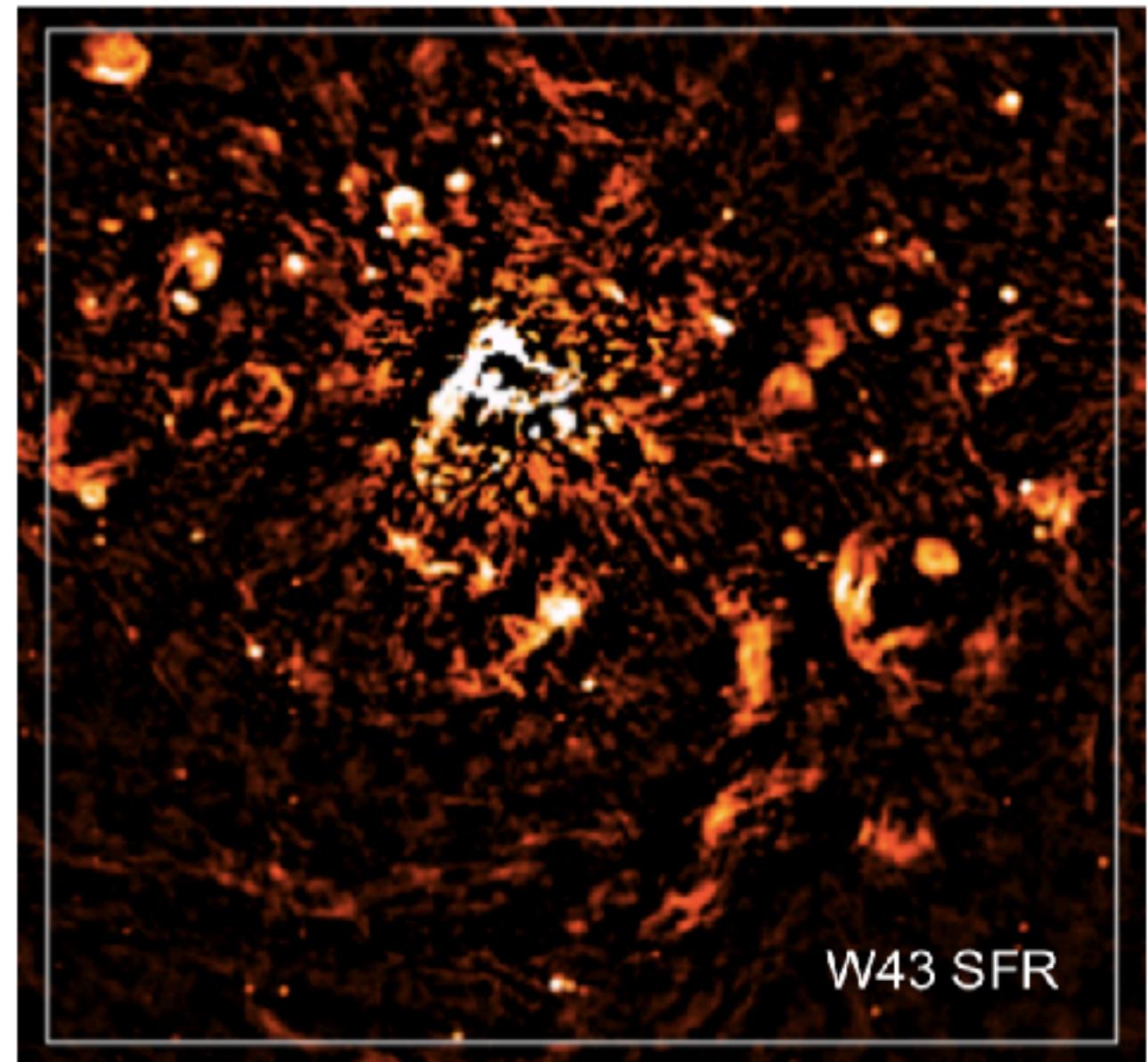
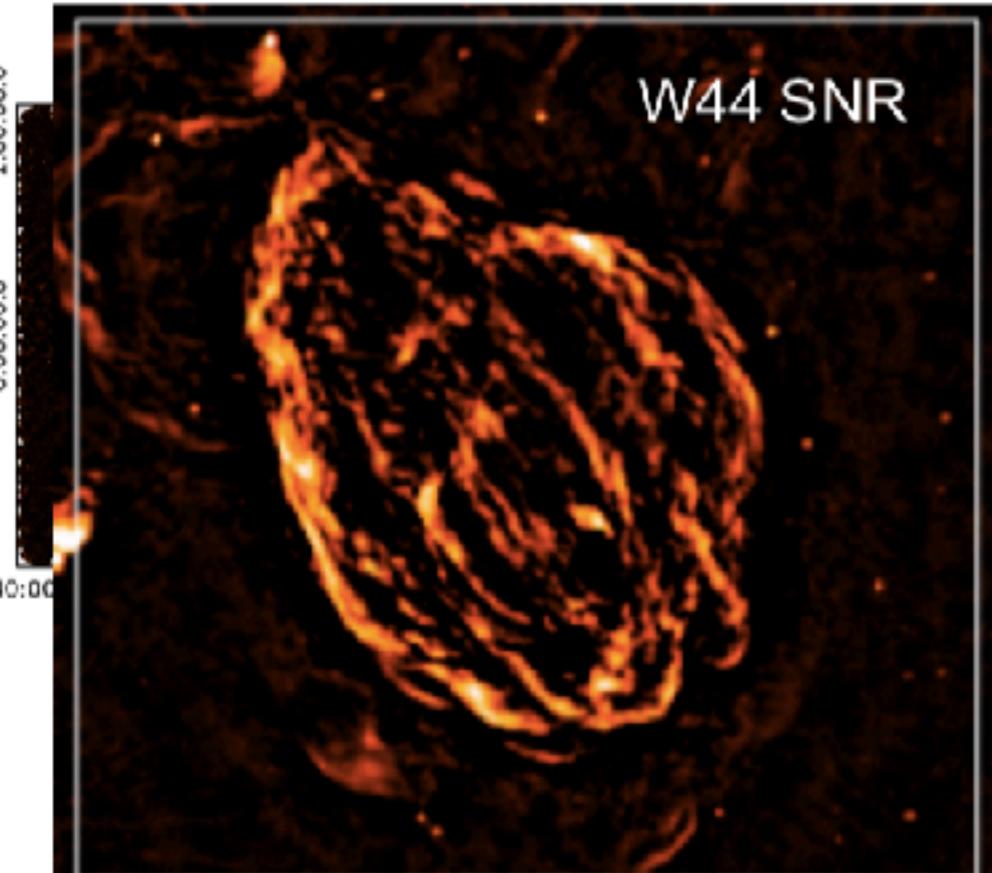
A Global View of Star Formation in
the Galaxy
4–8 GHz K. G. Jansky VLA Survey

Overview

- $|l| = [-2, 60]\text{deg}$, $|b| < 1\text{deg}$, $|l| = [76, 83]\text{deg}$, $b = [-1, 2]\text{deg}$
- VLA D-array (15''), B-array (1.5'')
- 2GHz continuum (全偏振信息)
 - 4.2-5.2 GHz & 6.4-7.4GHz → 40 Jy sensitivity → 10 times deeper
- 6.7 GHz methanol maser → 20 mJy@0.18km/s sensitivity
- 4.8 GHz H₂CO absorption → 20 mJy@0.25km/s sensitivity
- 7 RRLs → 5 mJy @3-4 km/s sensitivity

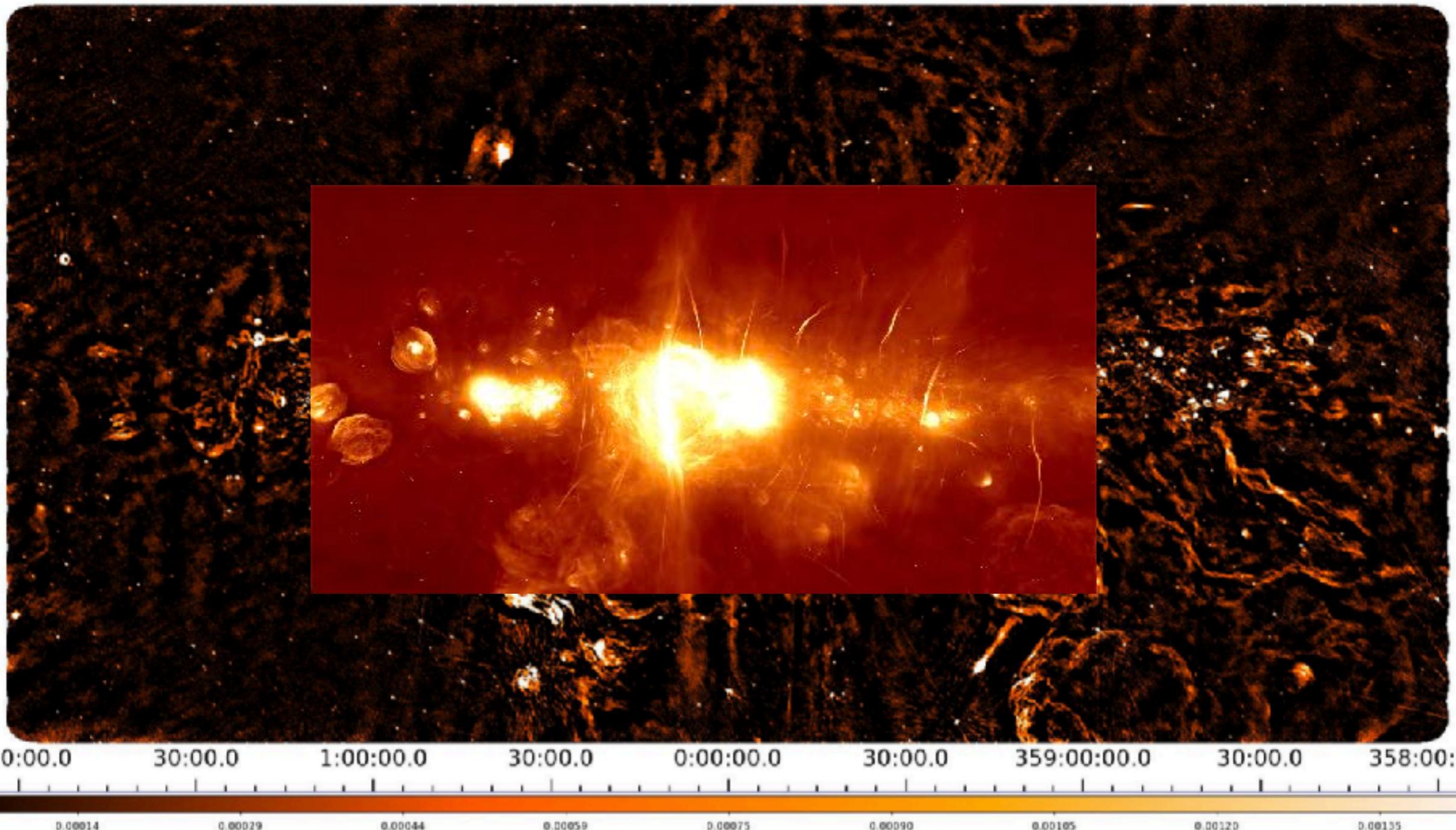


GLOSTAR JVLA
4–8 GHz
“Pilot Field”
 $28^\circ < l < 40^\circ$



The Galactic center region (Central Molecular Zone)

Compared with MeerKat (better UV coverage)



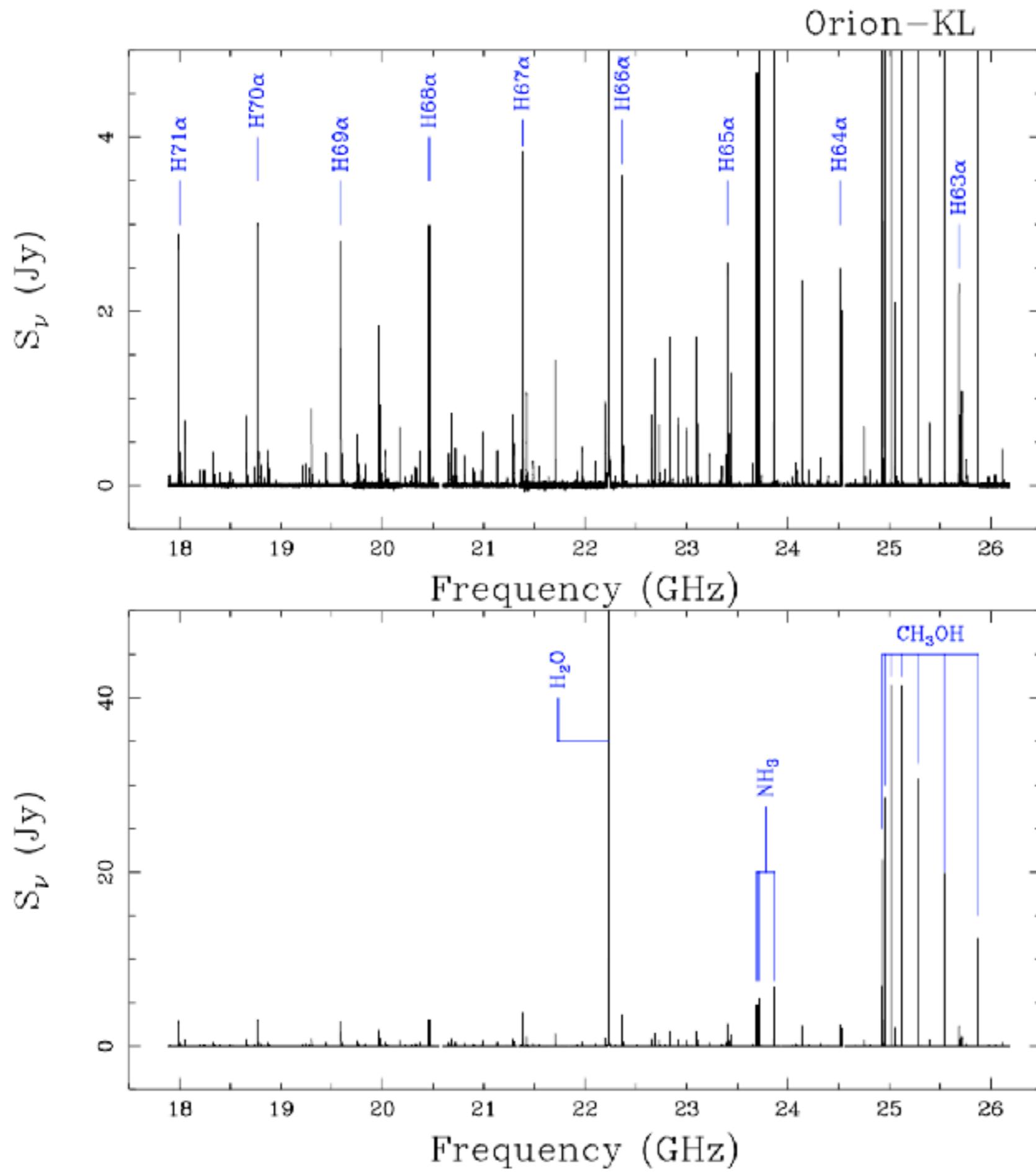
Zero Spacing!!! → C band (Effelsberg-100m)

products

- continuum/line images/cubes from VLA, Effelsberg, the VLA/Effelsberg combined data
- detected continuum sources with spectral indices
- catalogs and spectra of the detected line emission of H₂CO and masers
- data cubes of RRL emission



**Why K band?
A state-of-art machine
for a line survey**



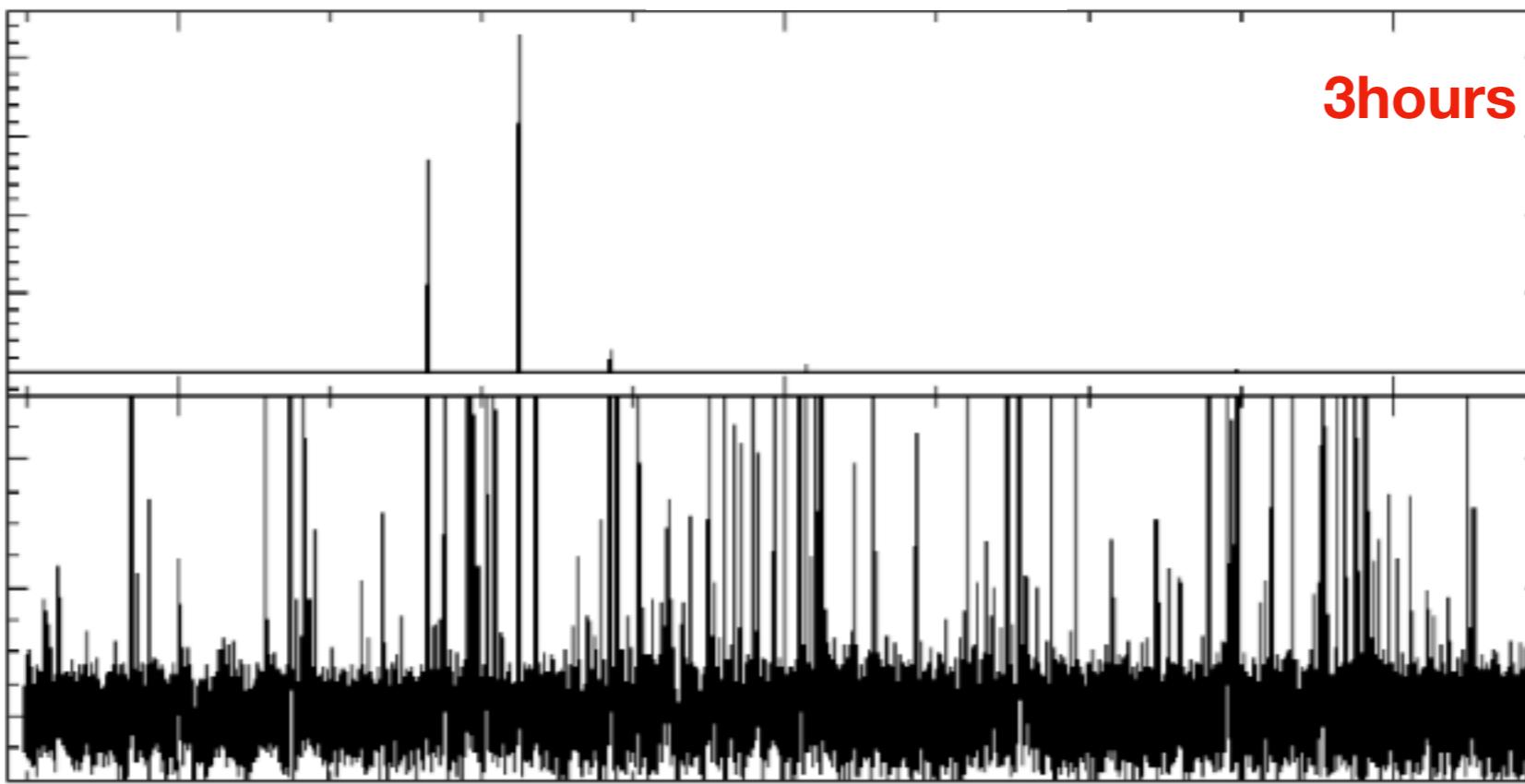
beam~40''@23GHz
新接收机同时获得8GHz
带宽光谱—谱分辨率0.4km/s

高谱分辨率模式：
H₂O+NH₃同时观测



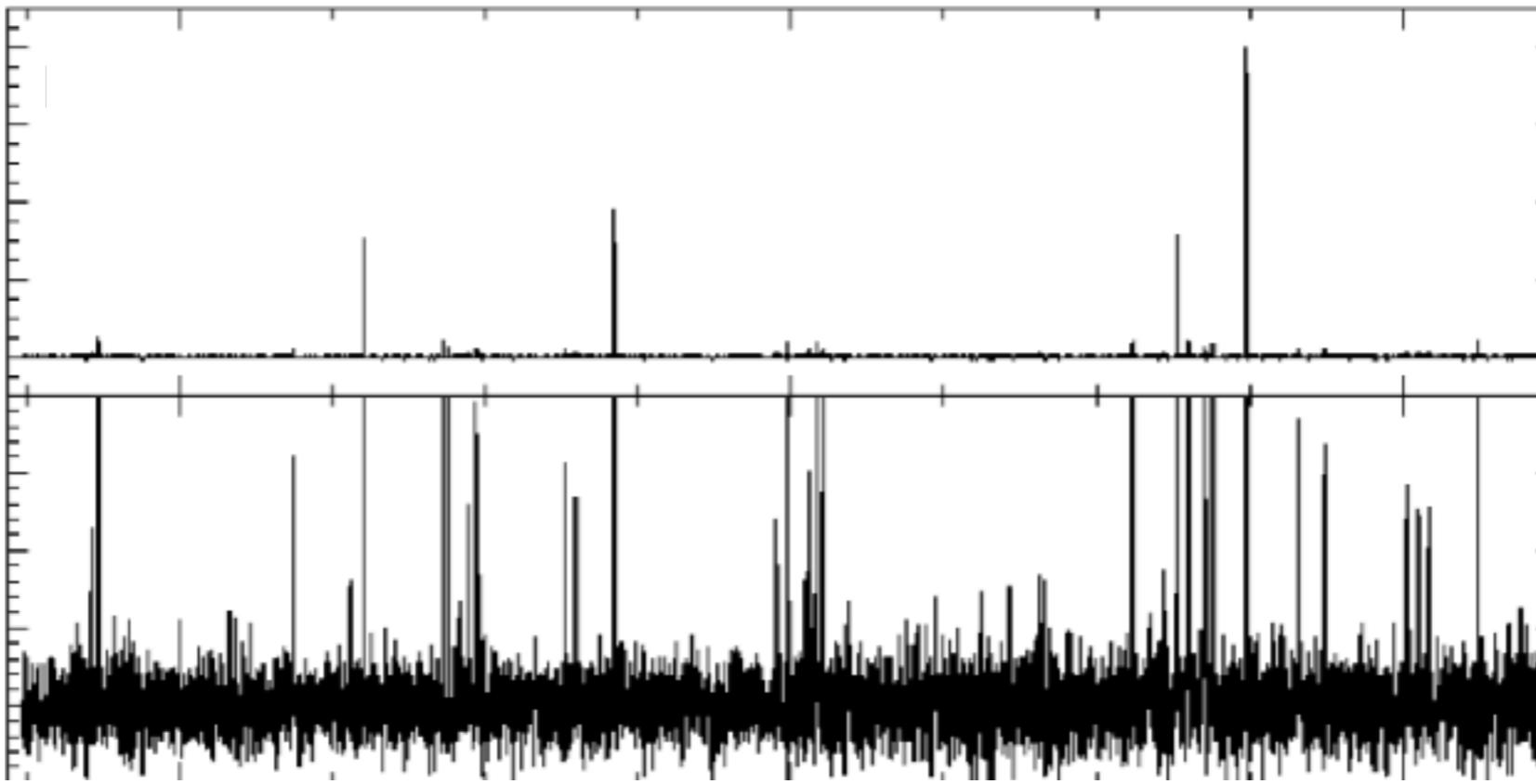
**Why Q band?
A state-of-art machine
for a line survey**

Q band line surveys stand by



**overview
the 7 mm spectra
baseline corrected**

**beam~18"
dv~0.27km/s**

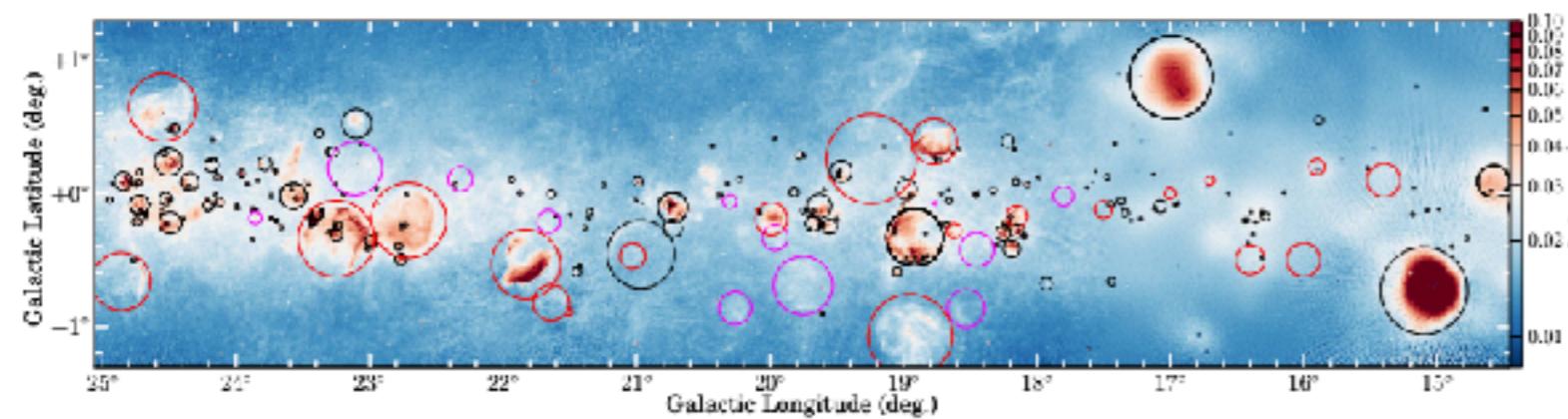
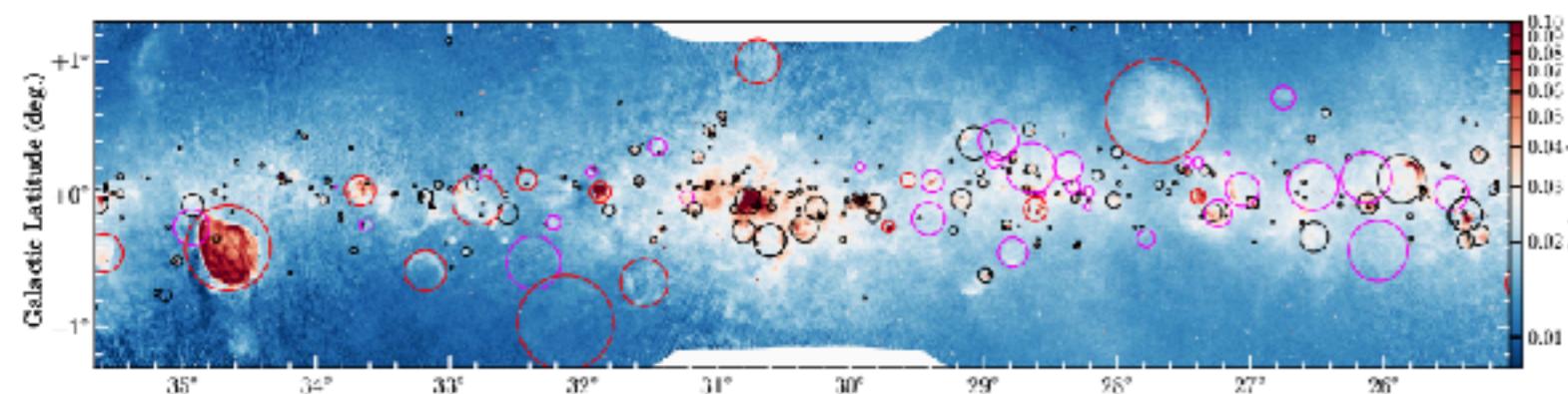
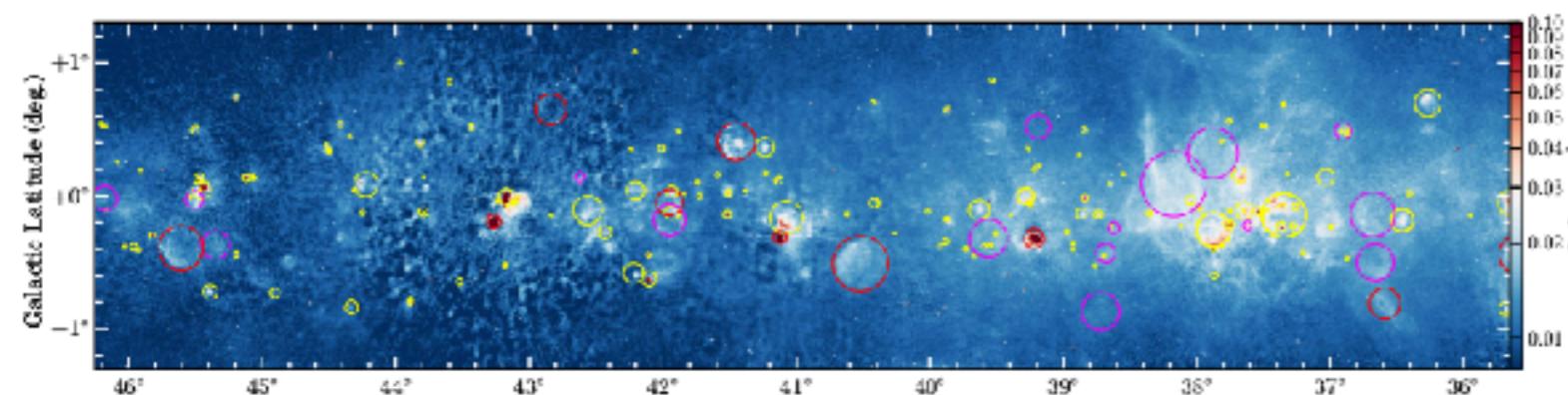
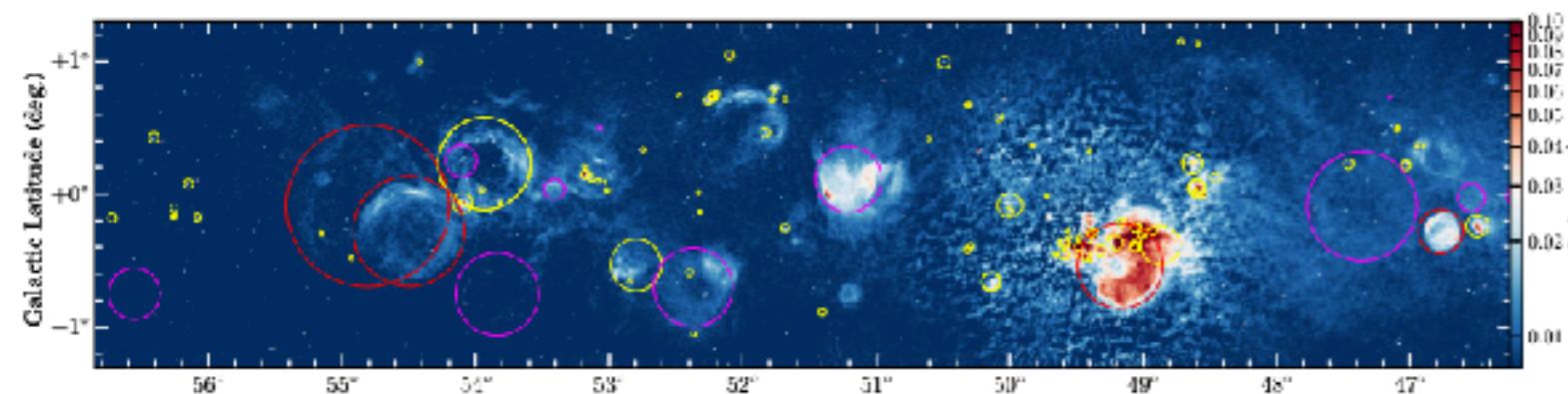
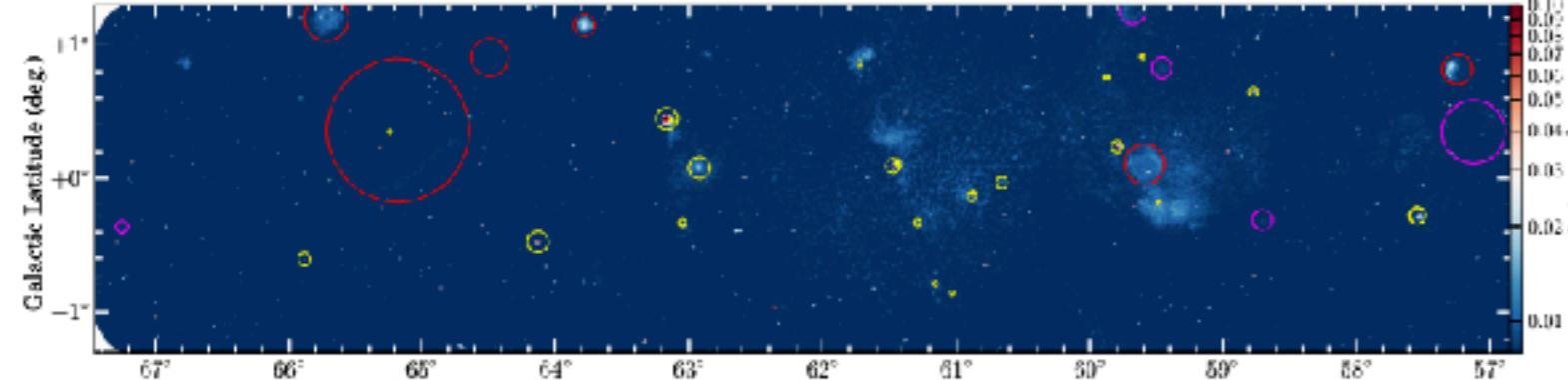




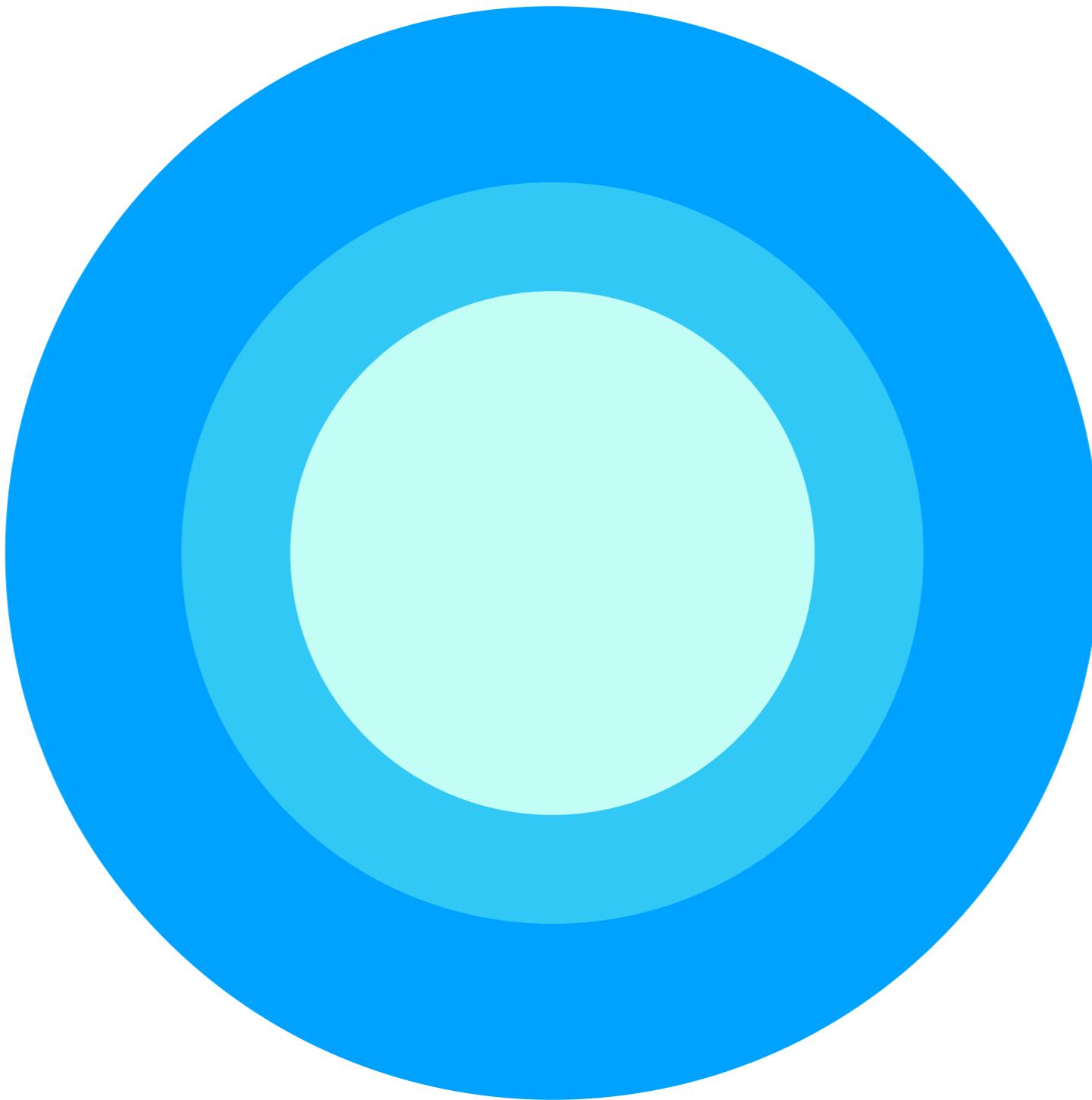
谢谢

The THOR survey: continuum

Wang+2018



Zero Spacing needed!!!



VLA: $B_{\min}=35$ m, Effelsberg is perfect for zero spacing