

MHD Simulation *of* SNR W51C

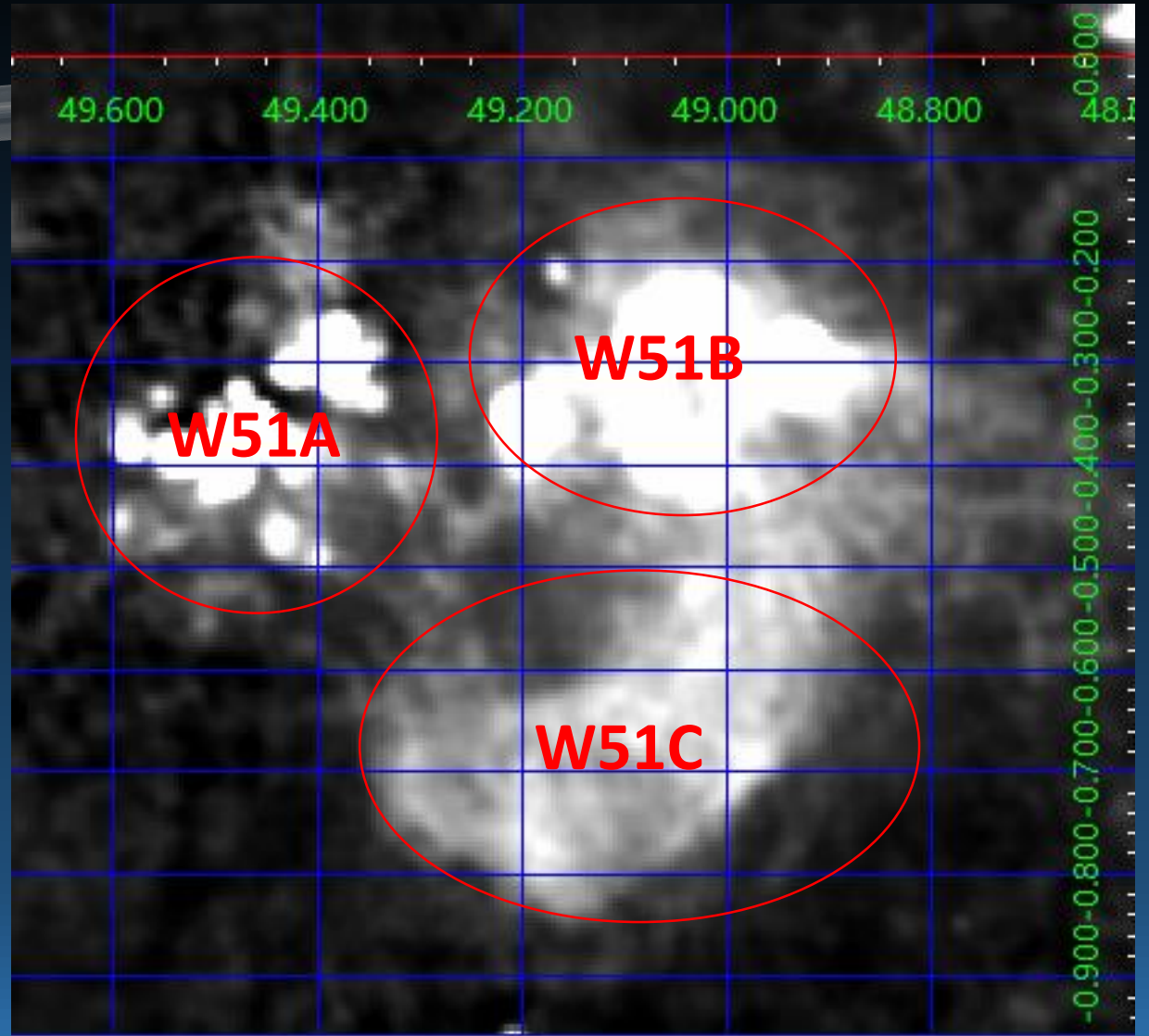
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National Astronomical Observatories of China

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Outline

- Simulation(W51C)
 - Density distribution
 - Reverse shocks
- Observation(W51C)
 - Magnetic field
 - X-ray、radio
 - high-energy、OH

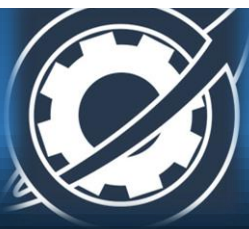
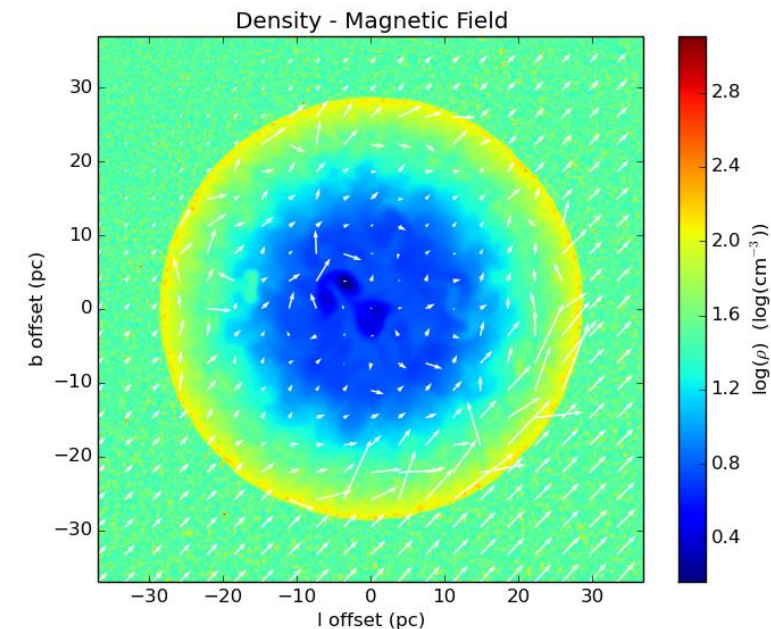
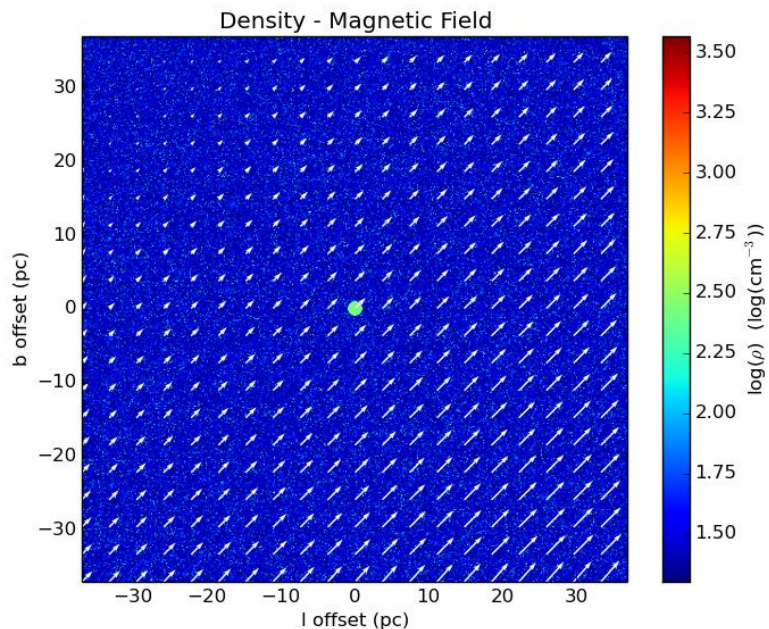


Simulation

- Density Distribution $N = N_0 \rho^{-\alpha}$ Parsons et al. (2012)

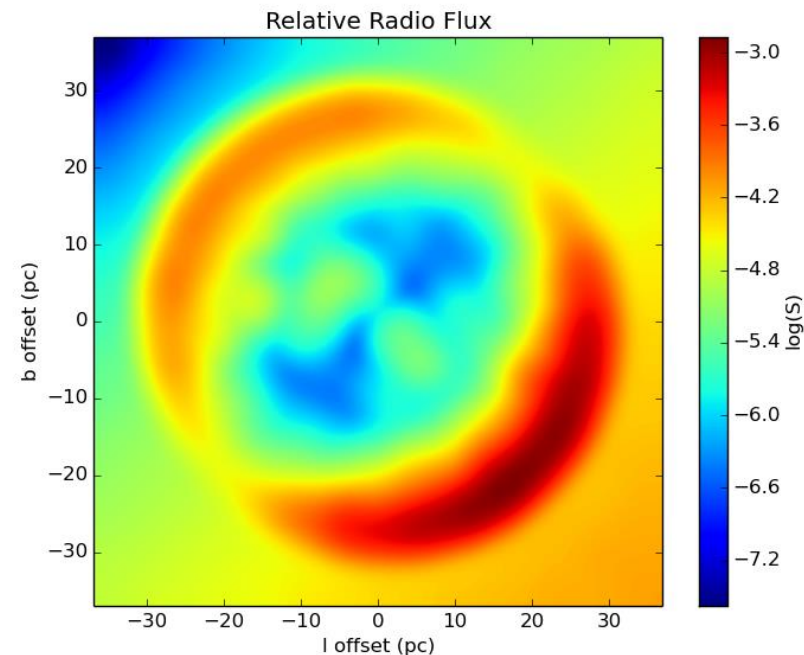
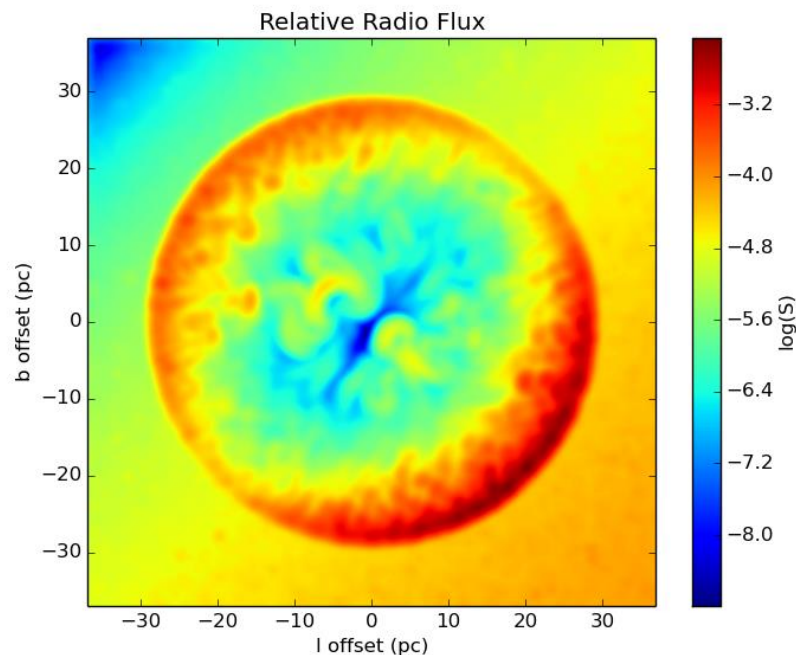
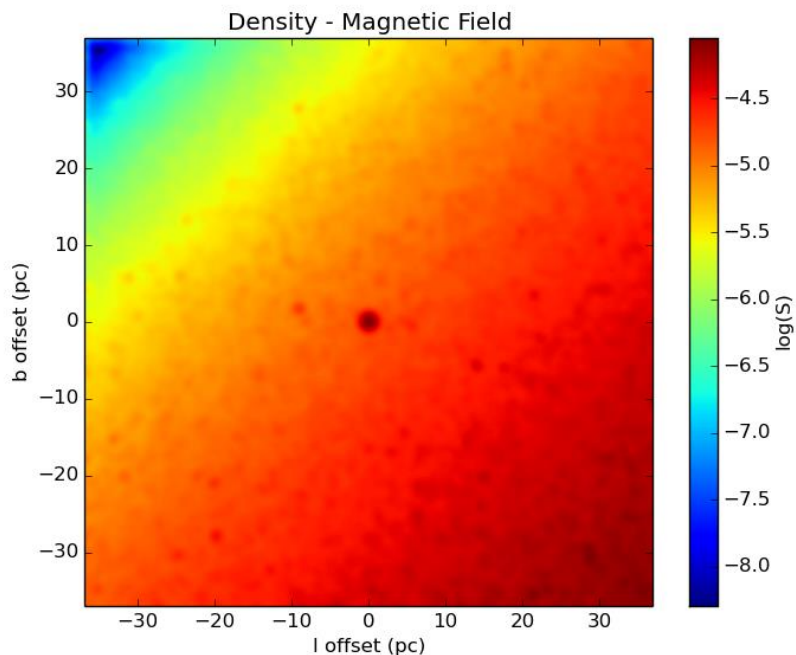
Table 1. Summary of Simulation Parameters on W51C

Parameters	Value	References
Progenitor Mass	$20 M_{\odot}$	Sasaki et al. (2014)
Explosion Kinetic Energy	$2.0 \times 10^{51} \text{ erg}$	Koo et al. (1995) Poznanski (2013)
Initial Radius	1 pc	
Initial Time	235 years	Sturmer et al. (1997) Jun & Norman (1996)
Mean Density	$> 20 \text{ cm}^{-3}$	Fang & Zhang (2010)
Density Index (α)	2.4	Parsons et al. (2012)
Magnetic Field Gradient	$0.1 \mu\text{G}/\text{pc}$	
Central Magnetic Intensity	$9 \mu\text{G}$	
Mean Atomic Mass	1.3	
Adiabatic Coefficient	1.4	
Temperature	100 K	
Synchrotron Index (β)	0.25	Shaver & Goss (1970)



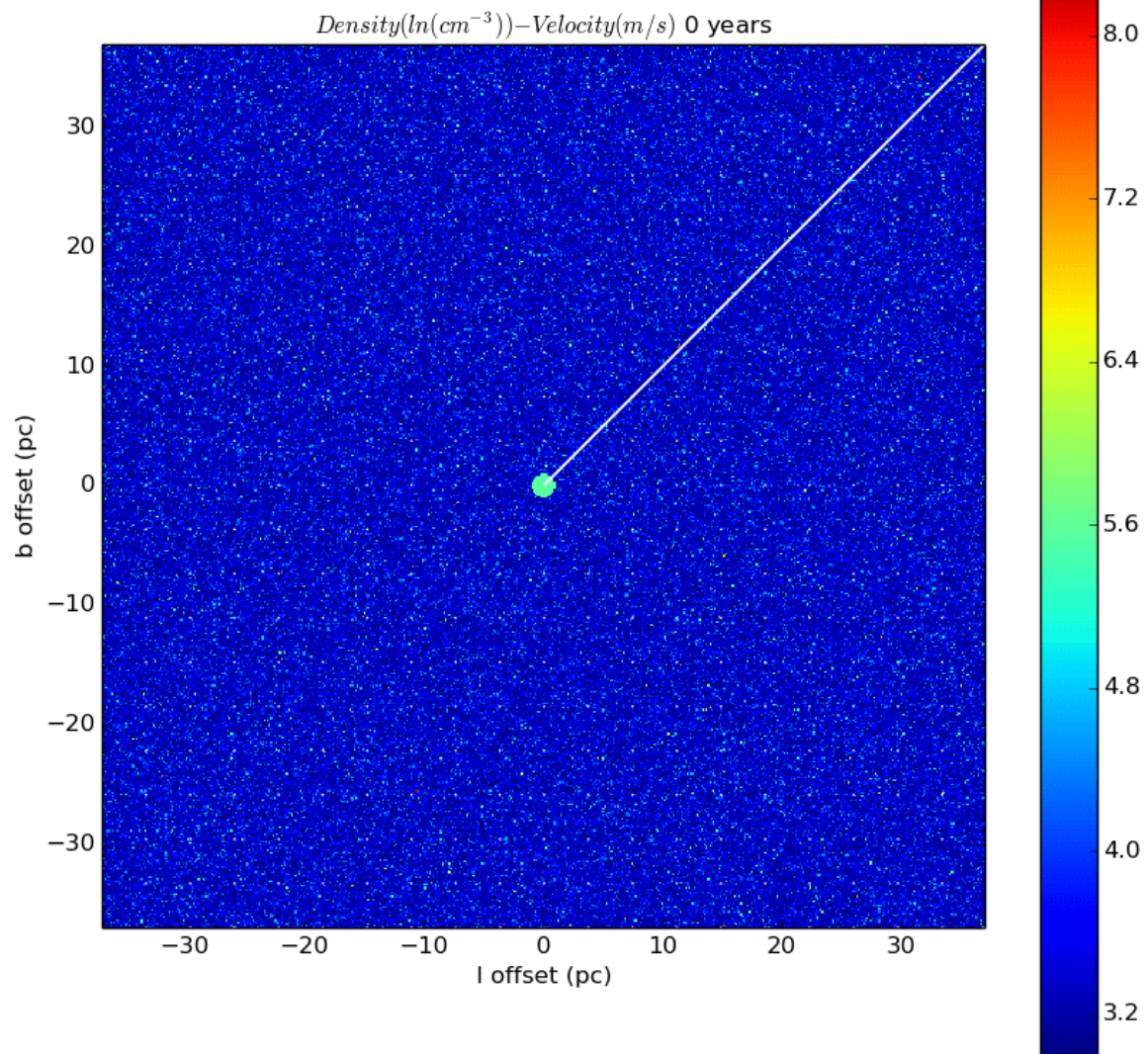
Simulation

- Flux and Smoothing $i(\nu) = C\rho B_{\perp}^{\beta+1} \nu^{-\beta}$ Orlando et al. (2007)

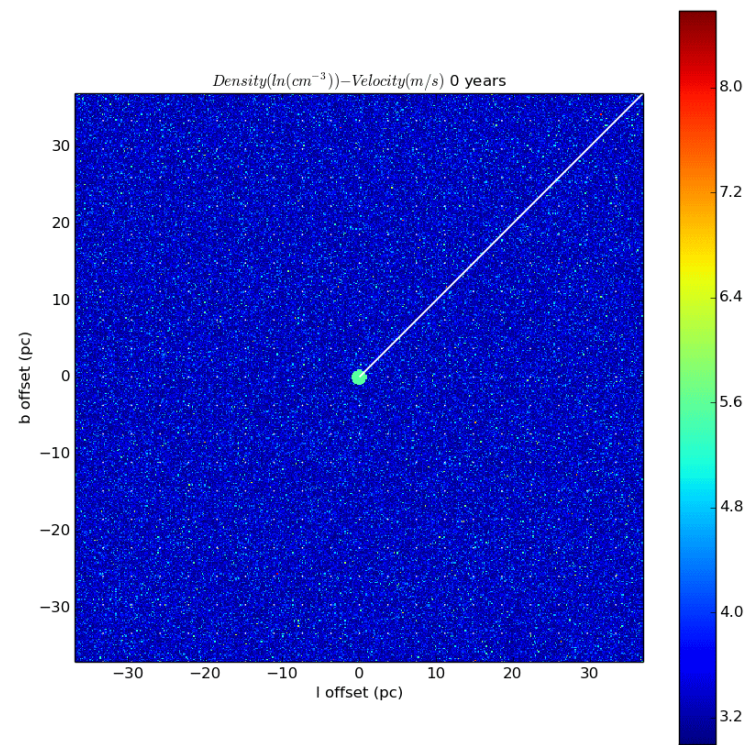
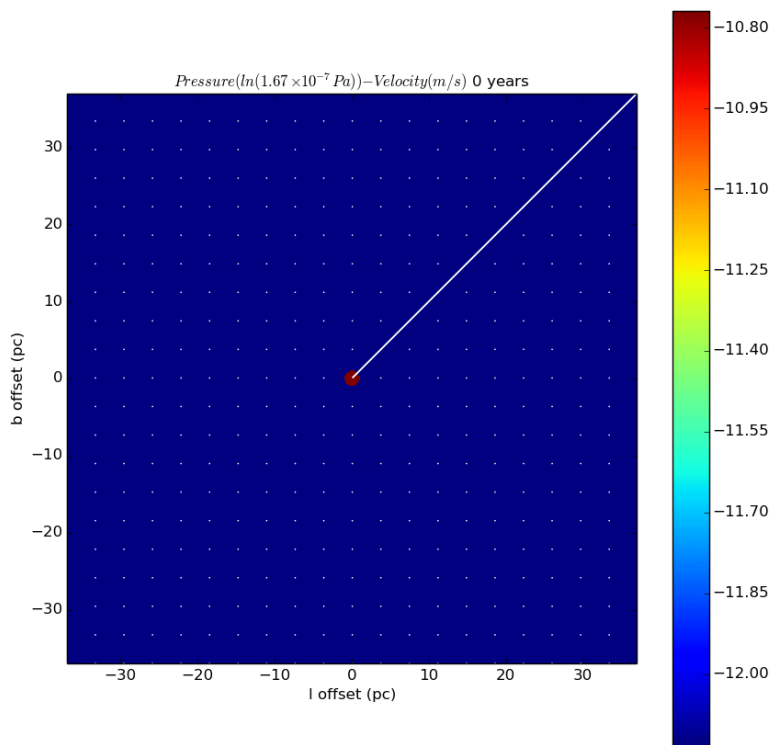


Simulation

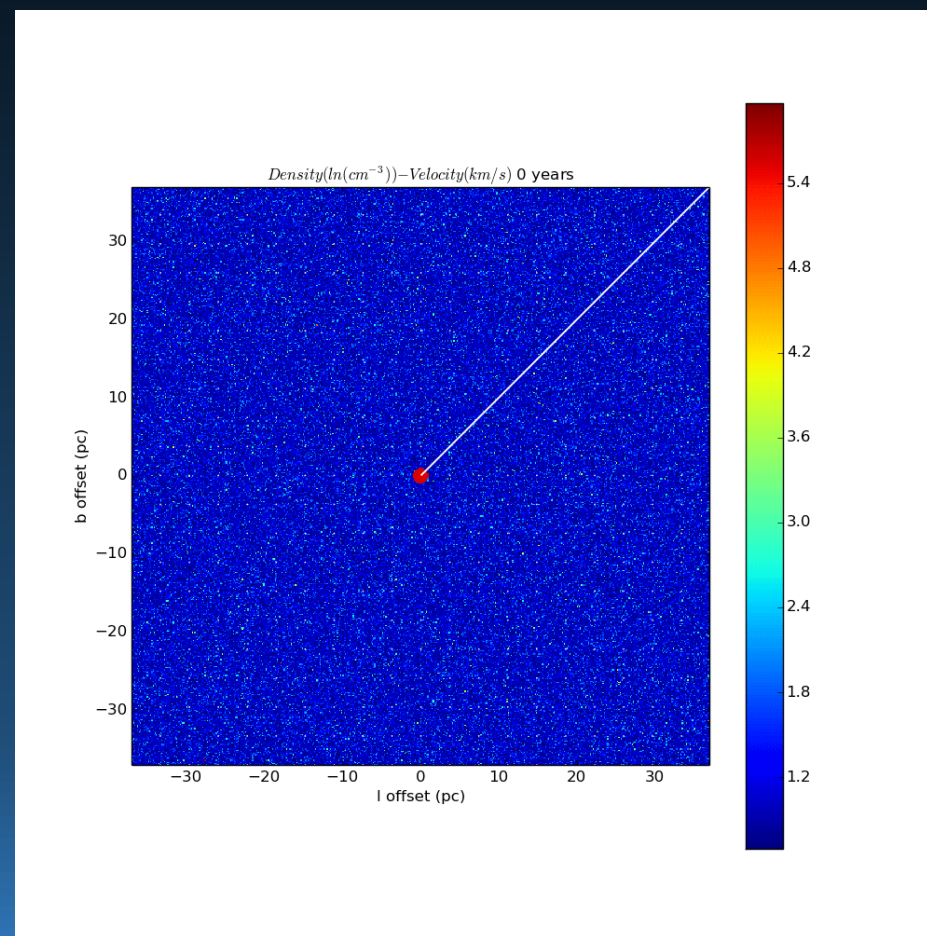
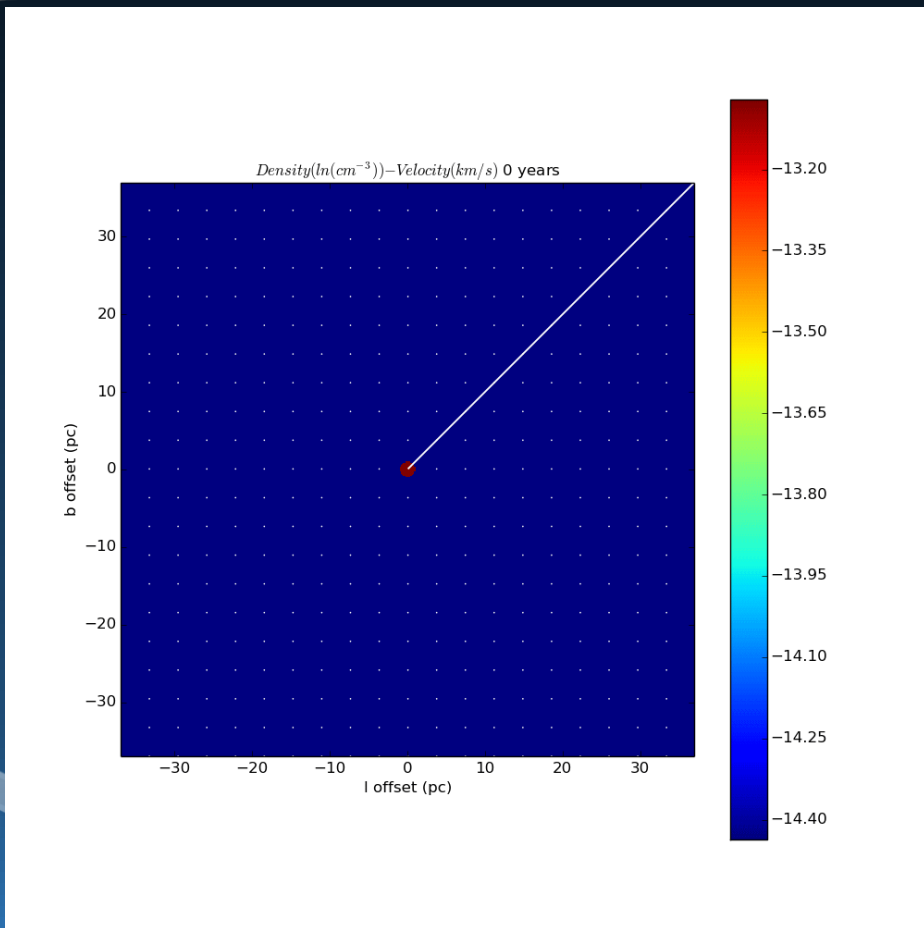
- Reverse Shocks



20 cm⁻³

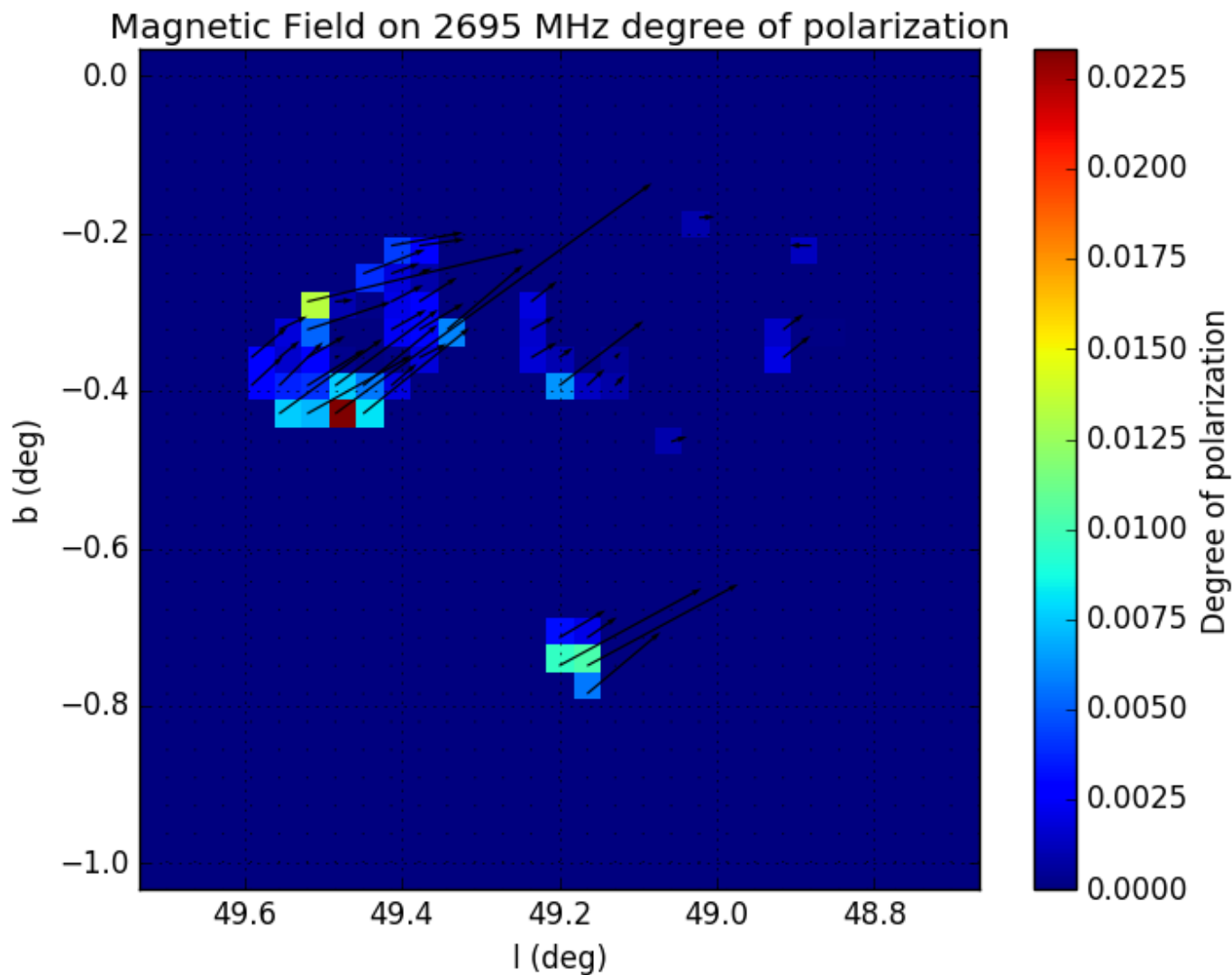
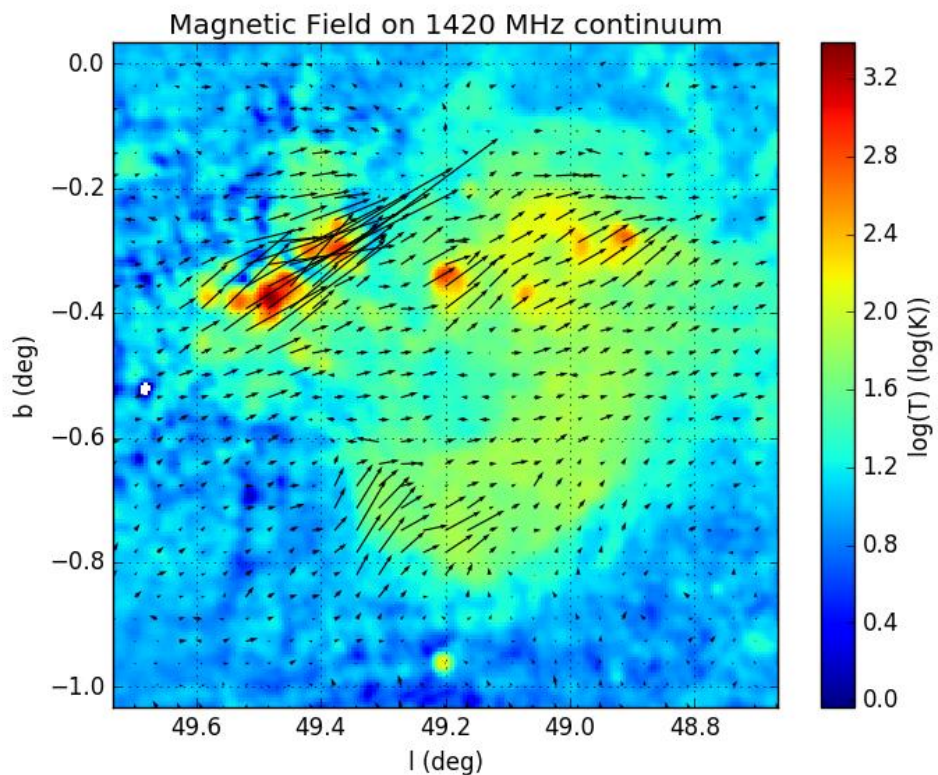


2 cm^{-3}



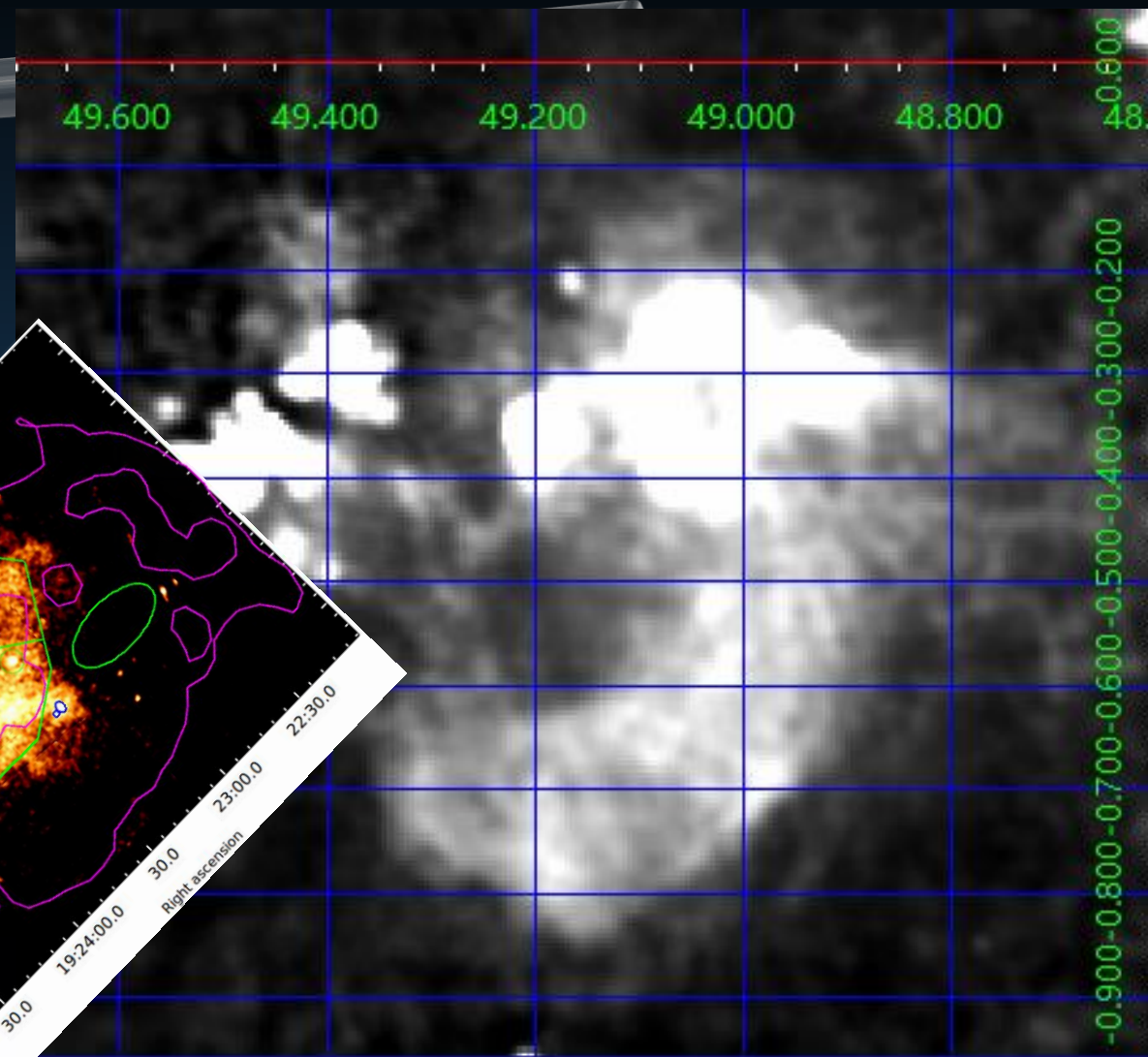
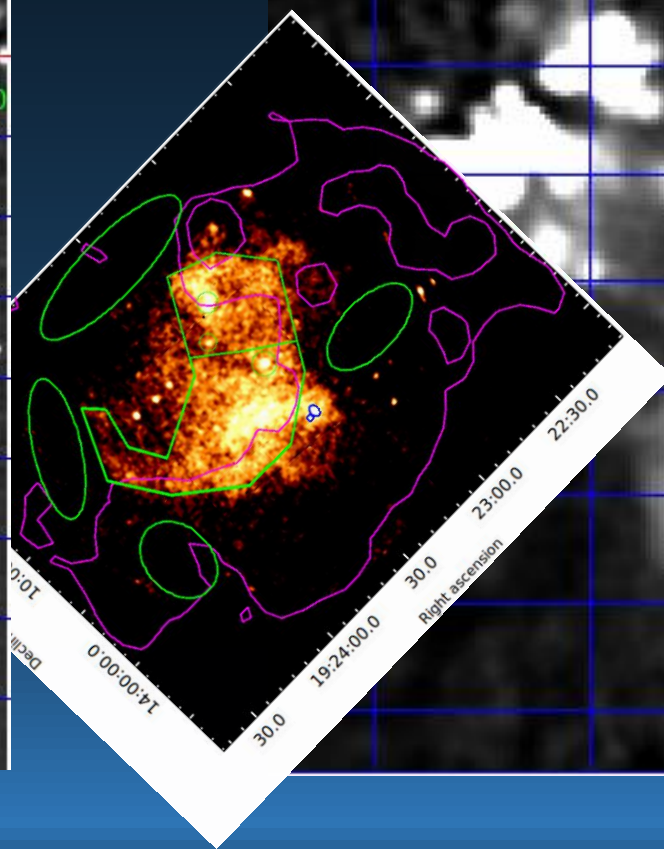
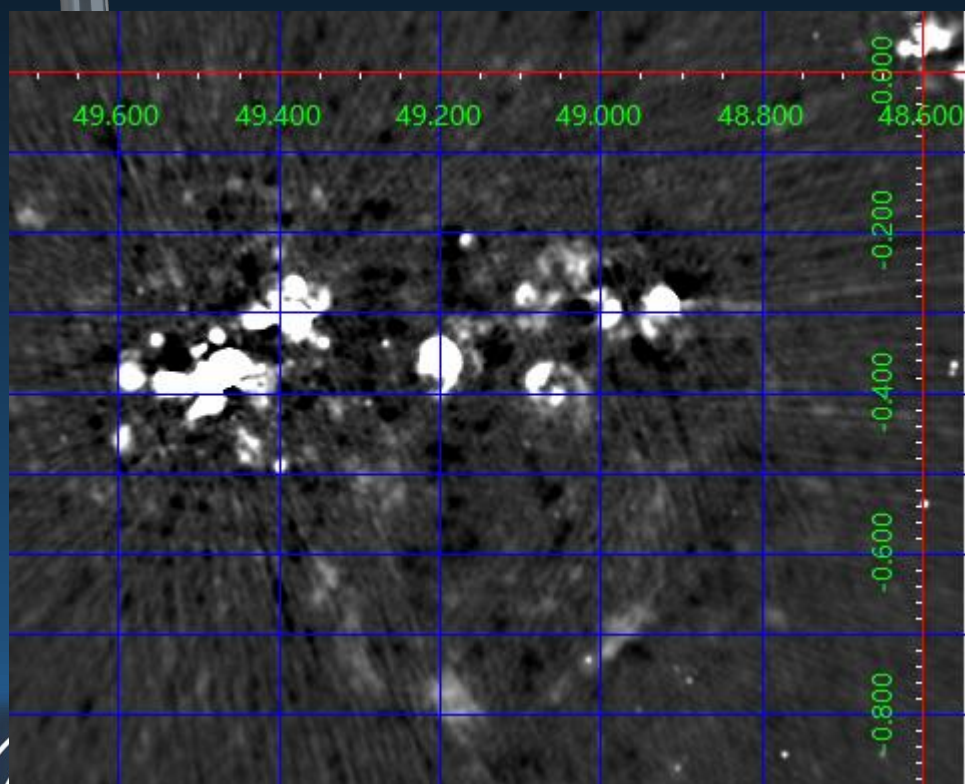
Observation

- Magnetic field



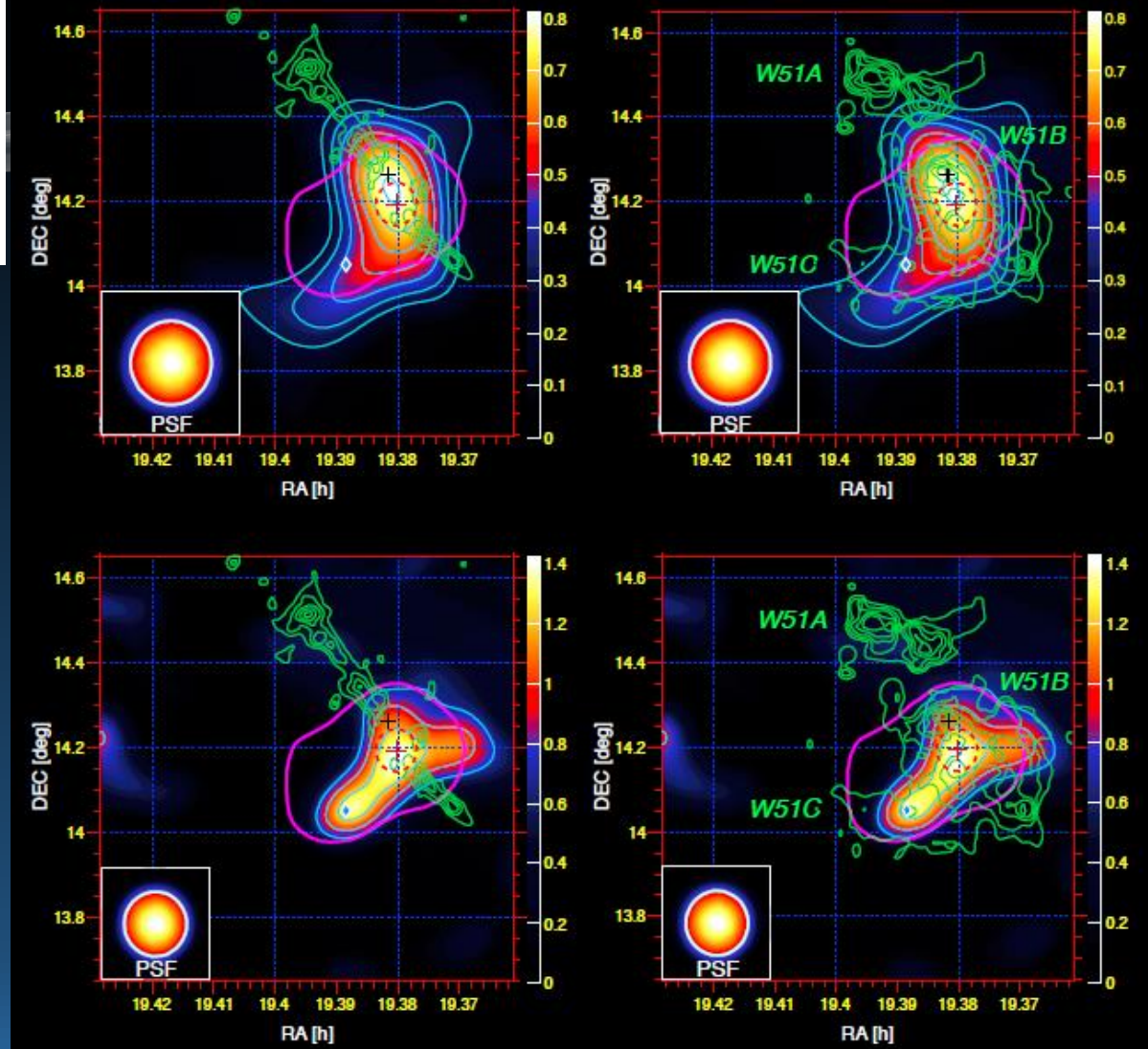
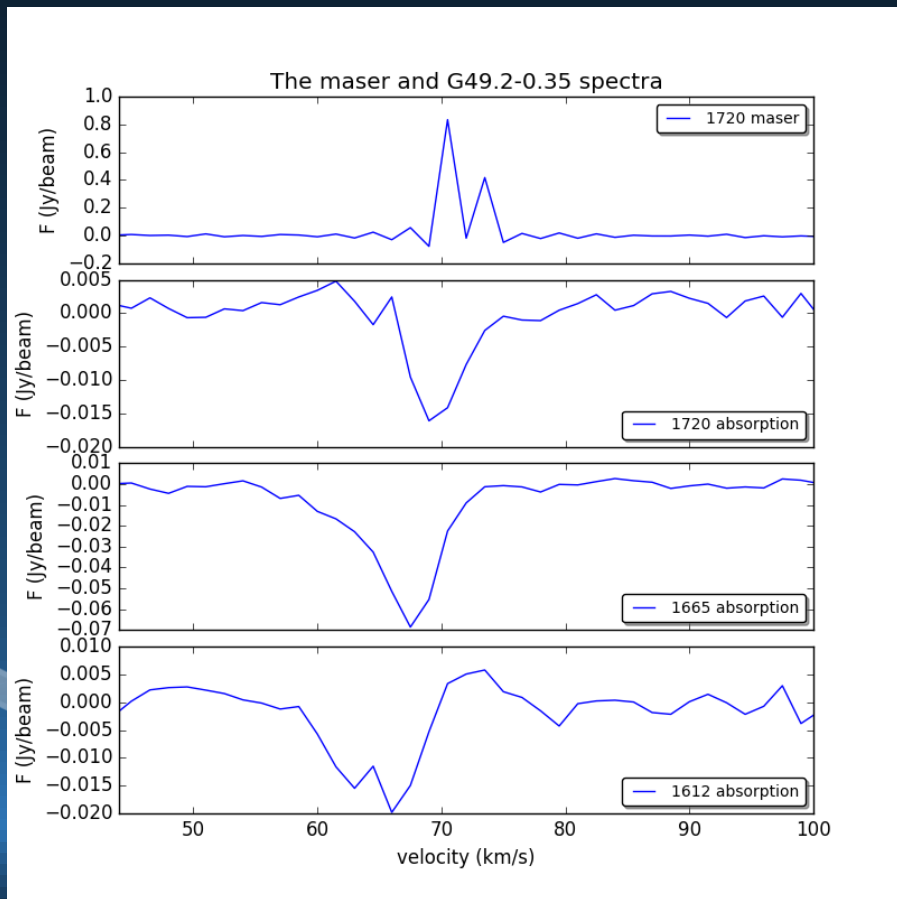
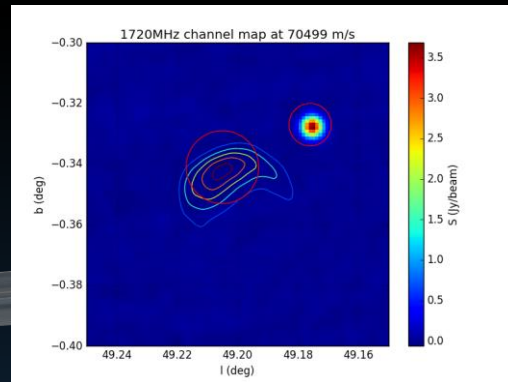
Observation

- X-ray, radio



Observation

- High-energy, OH



(MAGIC,2012)

Thanks