

6th 2022 ALMA SUMMER SCHOOL

Self-Calibration of Molecular Gas Region G10.32

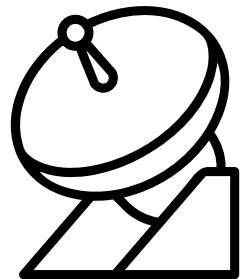
Group 1

Ji-hyun Kang(adviser), KASI

Shanghuo Li, KASI.

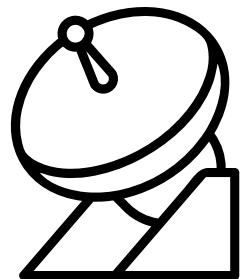
Jae-Hong Jeong, Seoul National Univ.

Jaebeom Kim, Sejong Univ.



Introduction

1. Imaging with no self-calibration on MS .
2. Self-calibration on MS using only spw 0.
 - a. Phase and amplitude calibration and imaging.
 - b. Only phase calibration and imaging.
3. Self-calibration on MS using spw 0,1,2,4.
4. Comparing results of 2 and 3 statistically.
5. Analysis kinematics component of G32.10 using the moment map.



Continuum Images applied the Phase+Amp Calibration

1. Phase calibration

Images	S/N	σ_{self}	S/N_{self}
Image0 (interactive=False)	63.3	-	-
Image0 (interactive=True)	91.6	3.5Jy	6.3
Image1	115.0	5.0Jy	4.6
Image2	114.3	-	-
Image0_ap	133.3	-	-

Continuum Images applied the Phase+Amp Calibration

2. Phase calibration table(solint=30s) : phase fluctuation



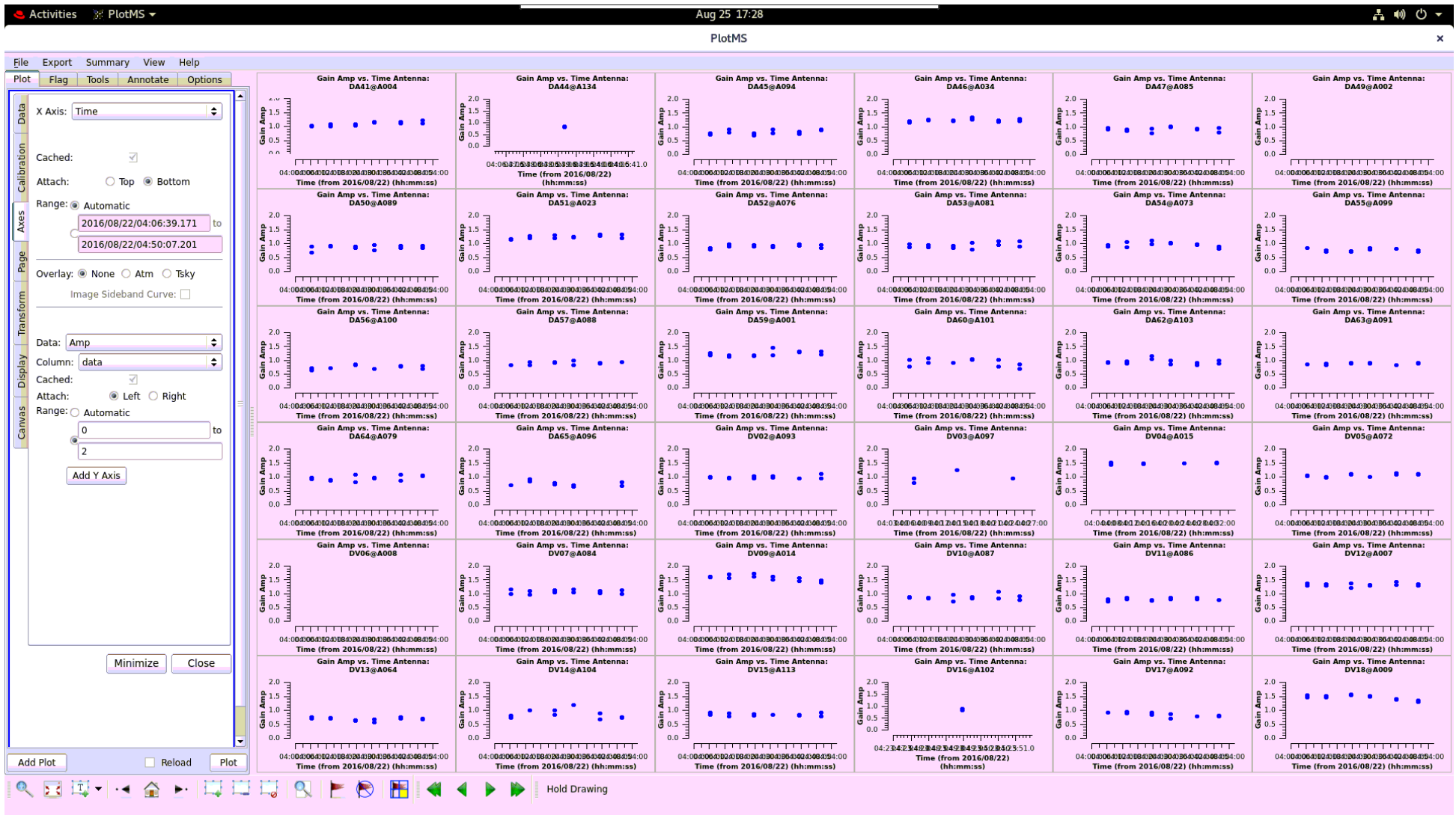
Continuum Images applied the Phase+Amplitude Calibration

3. Amplitude calibration table : phase fluctuation



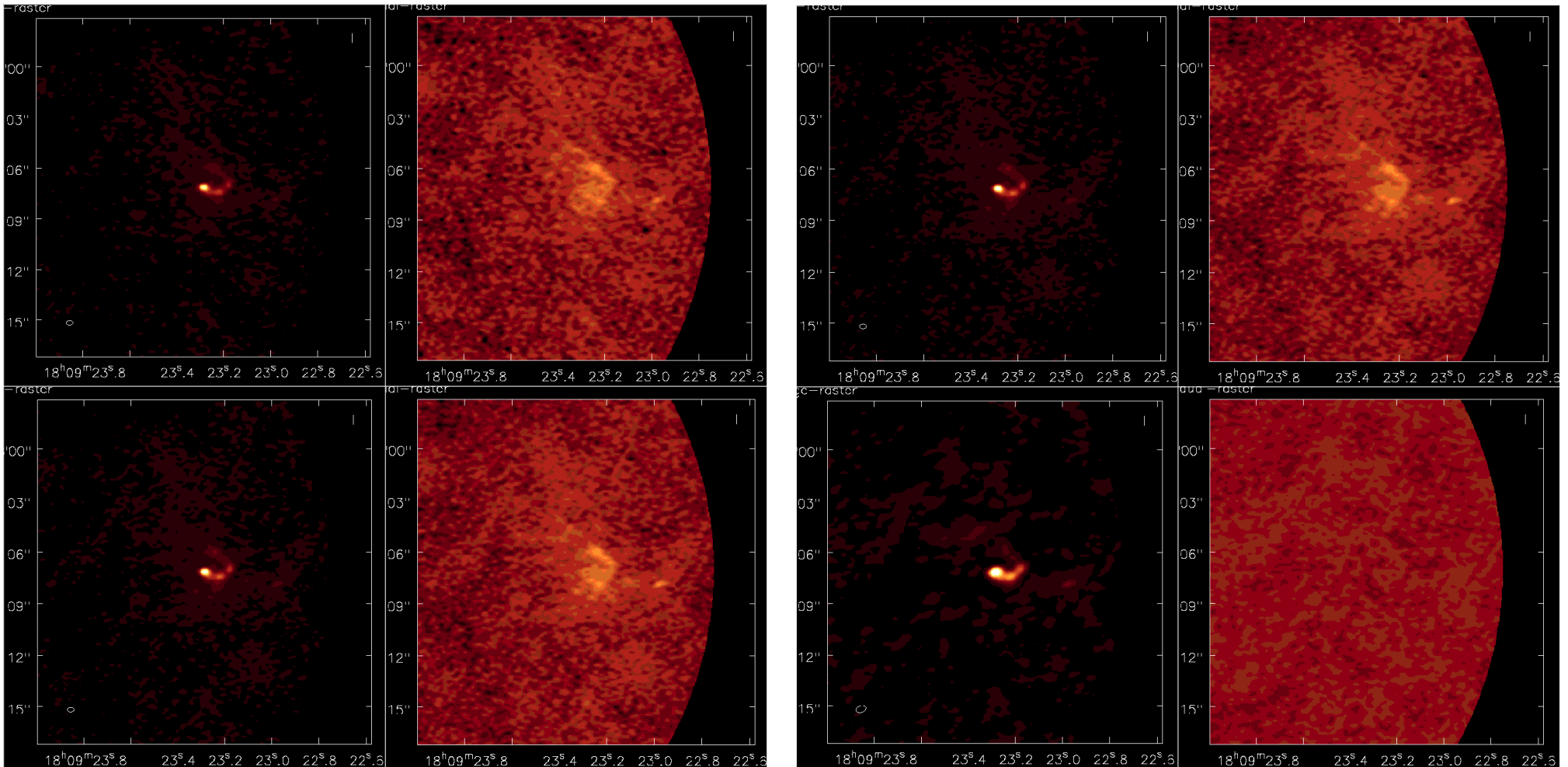
Continuum Images applied the Phase+Amplitude Calibration

4. Amplitude calibration table : amplitude fluctuation



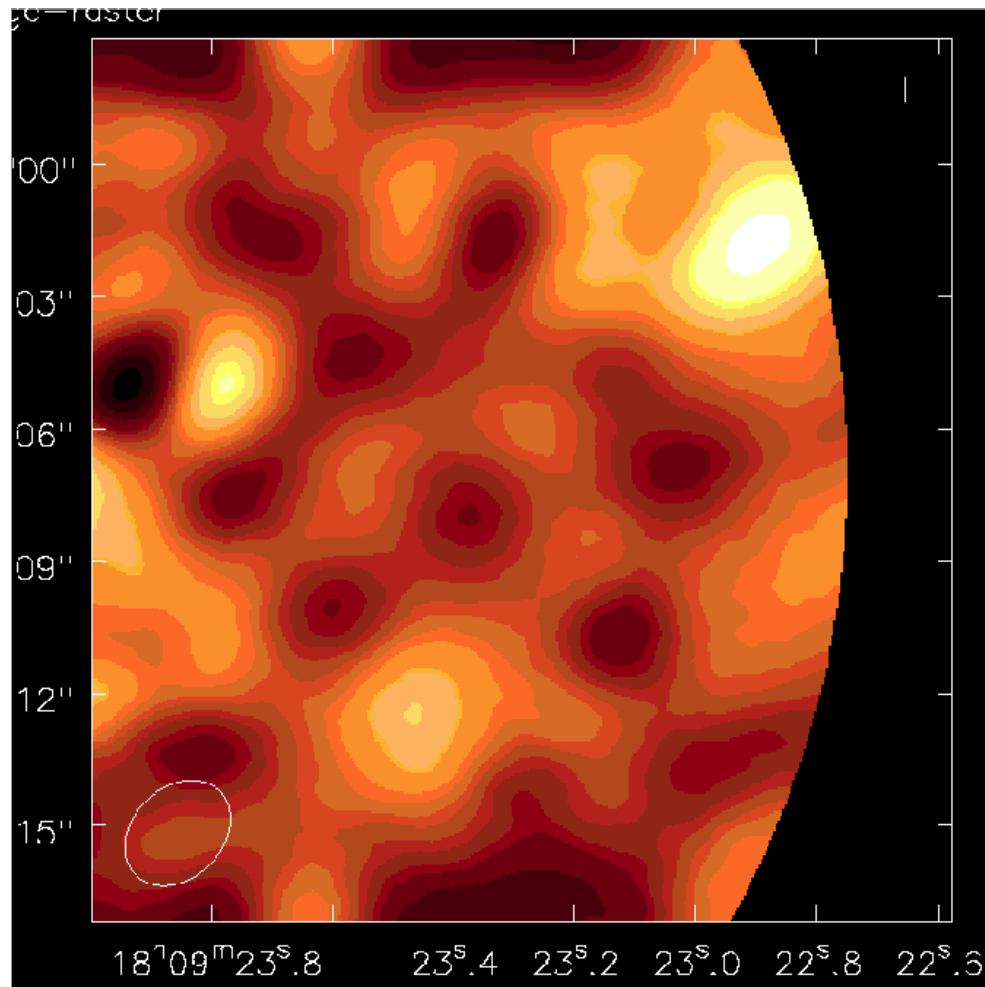
Line Images applied the Phase+Amp Calibration

5. Phase+amp calibration continuum images



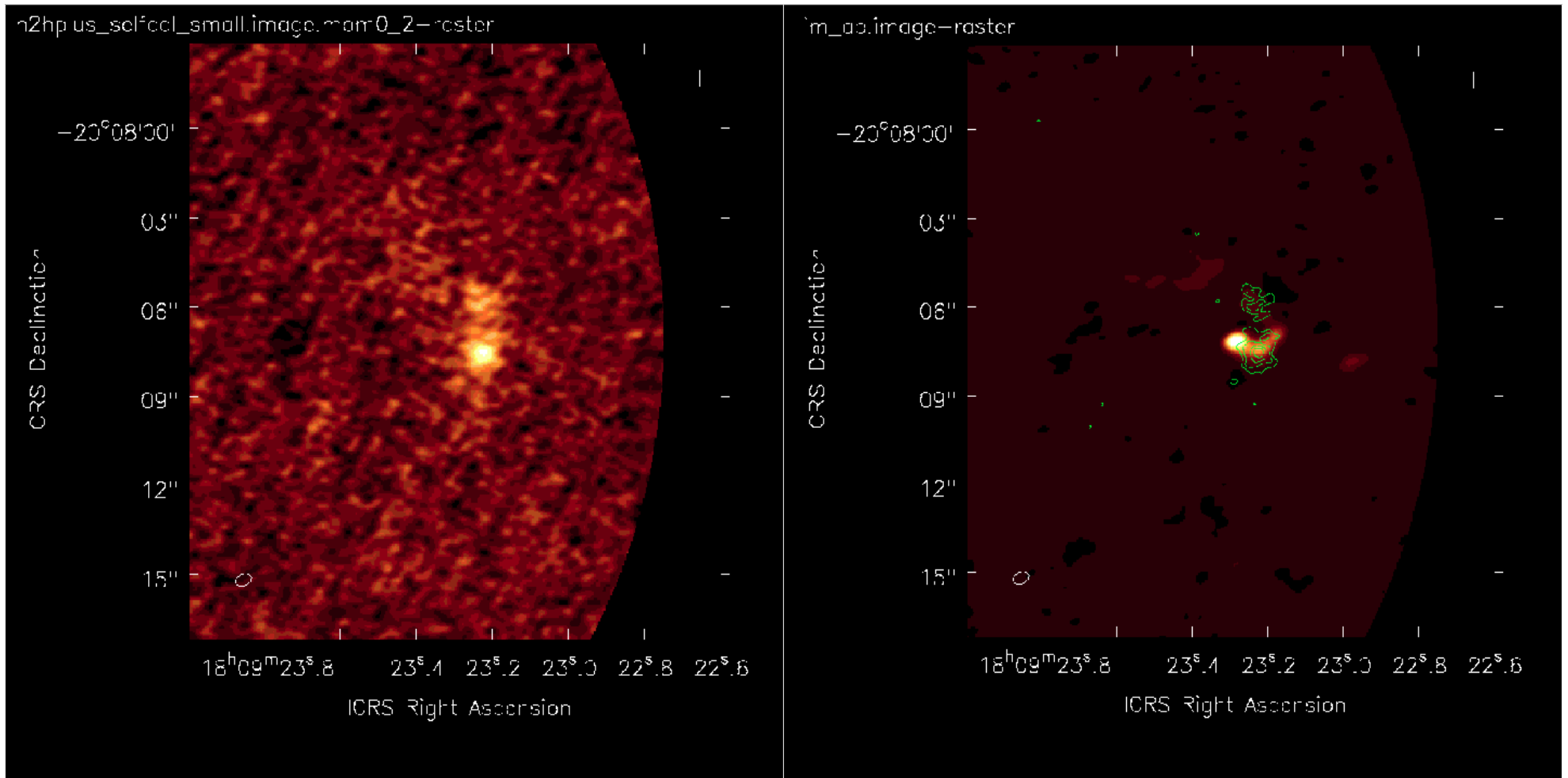
Continuum Images applied the Phase+Ampl Calibration

6. If we apply amplitude gaincal solint='30s'..?



Line Images applied the Phase+Amplitude Calibration

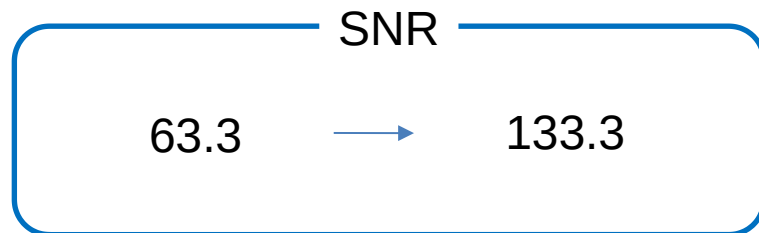
7. Phase+amp calibration line images



Continuum Self-Calibration: Different Trial

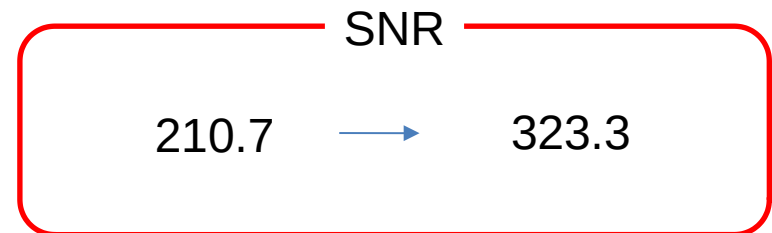
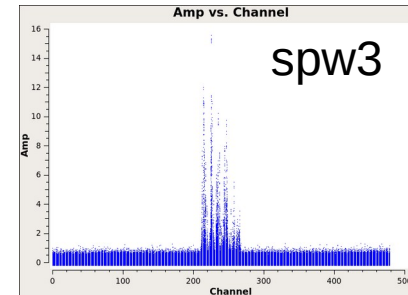
Before

- SPW: 0
- Phase Calibration: twice (solint inf & 30s)
- Amplitude Calibration: Once

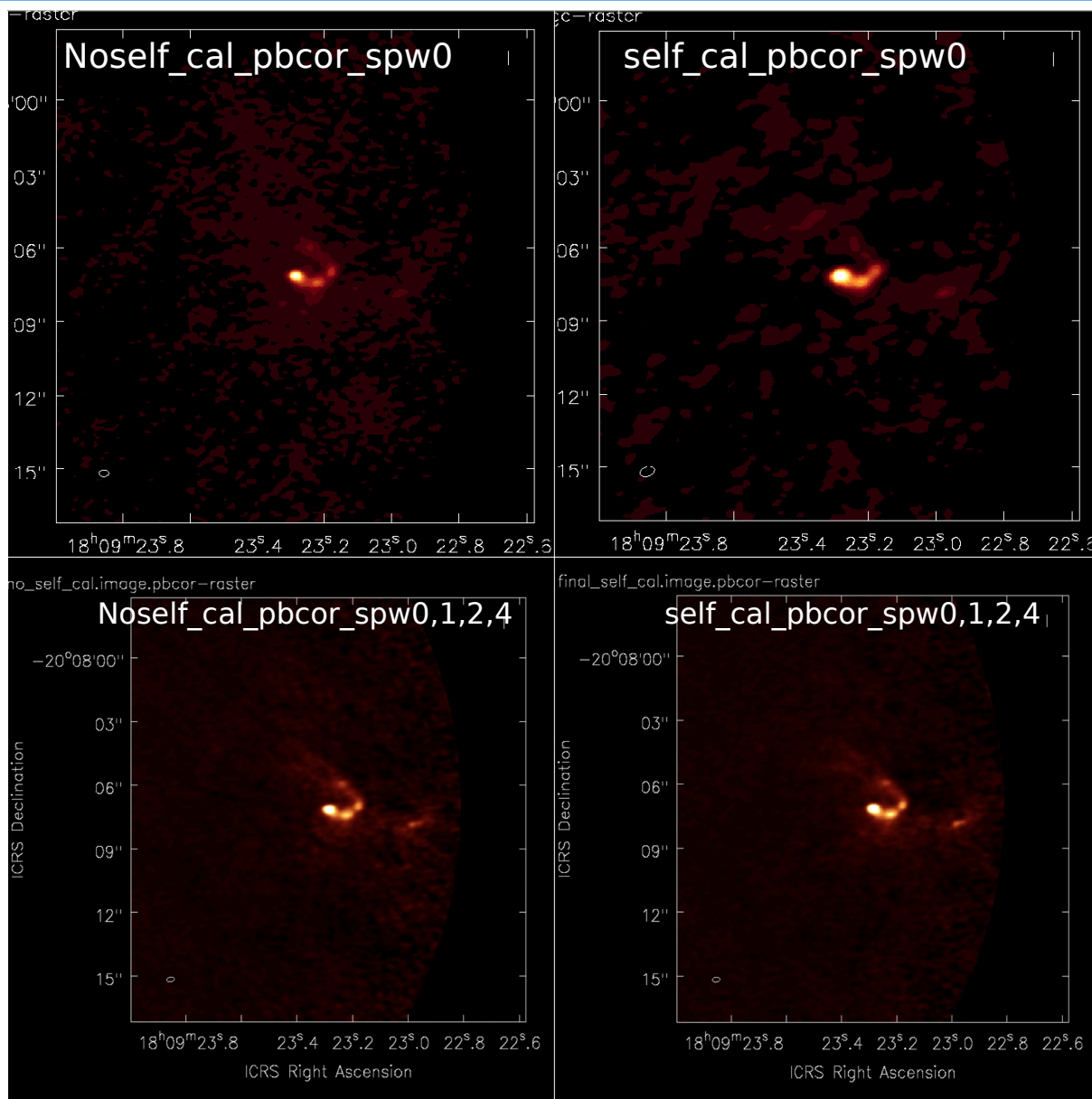


After

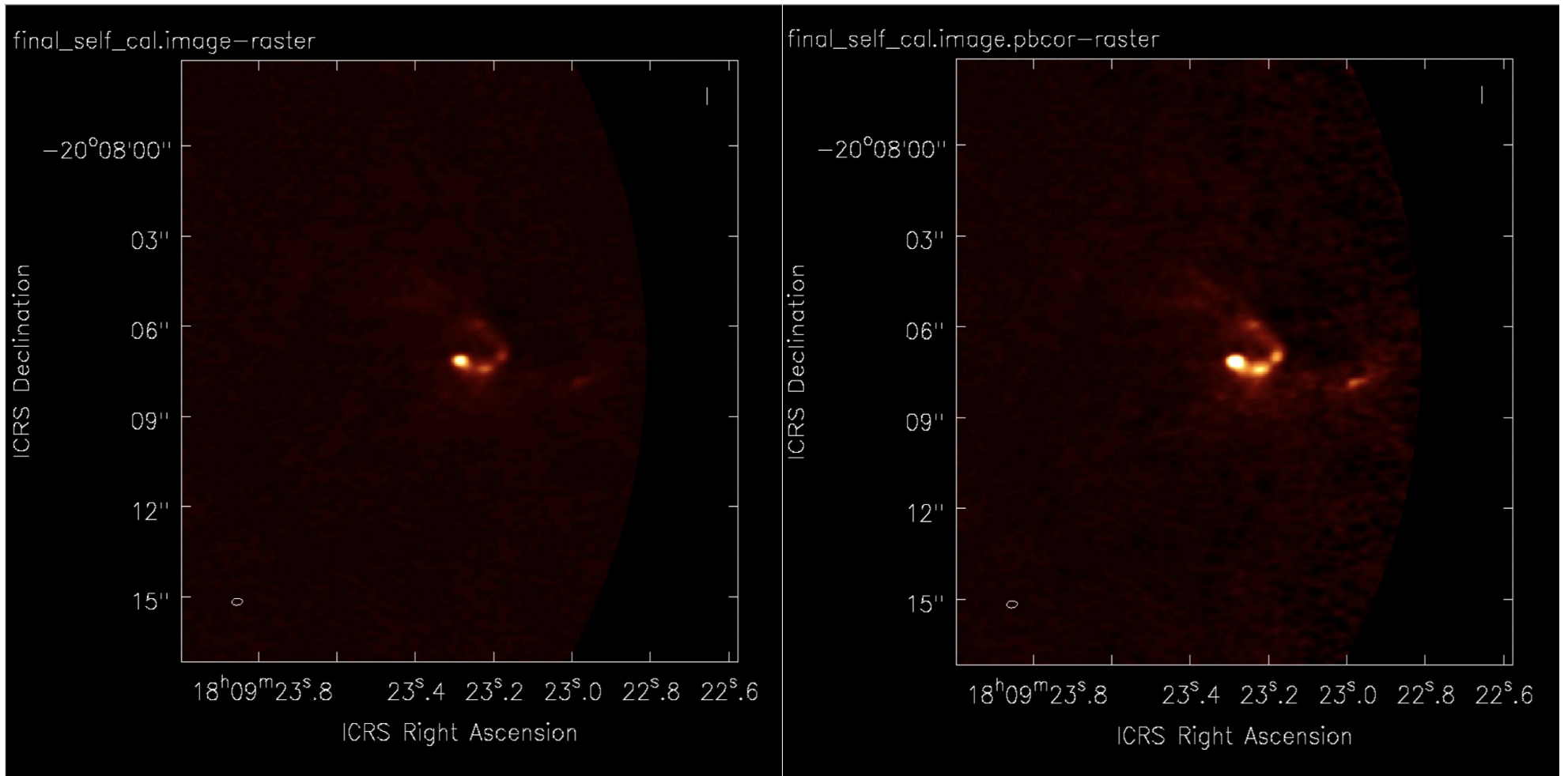
- SPW: 0, 1, 2, 4 (they are line-free spws)
- Phase Calibration: twice (solint inf & 60s)
- Amplitude Calibration: None



Continuum Self-Calibration: Different Trial



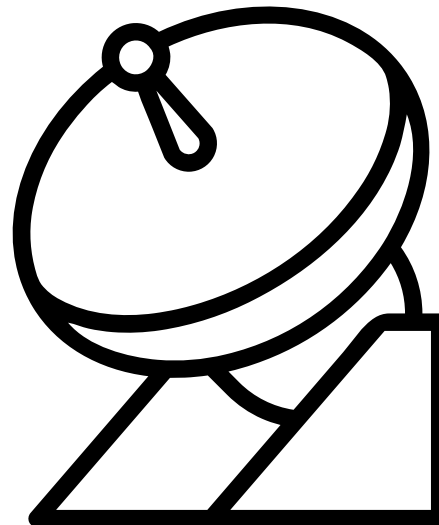
Effect of Primary Beam Correction



Q & A



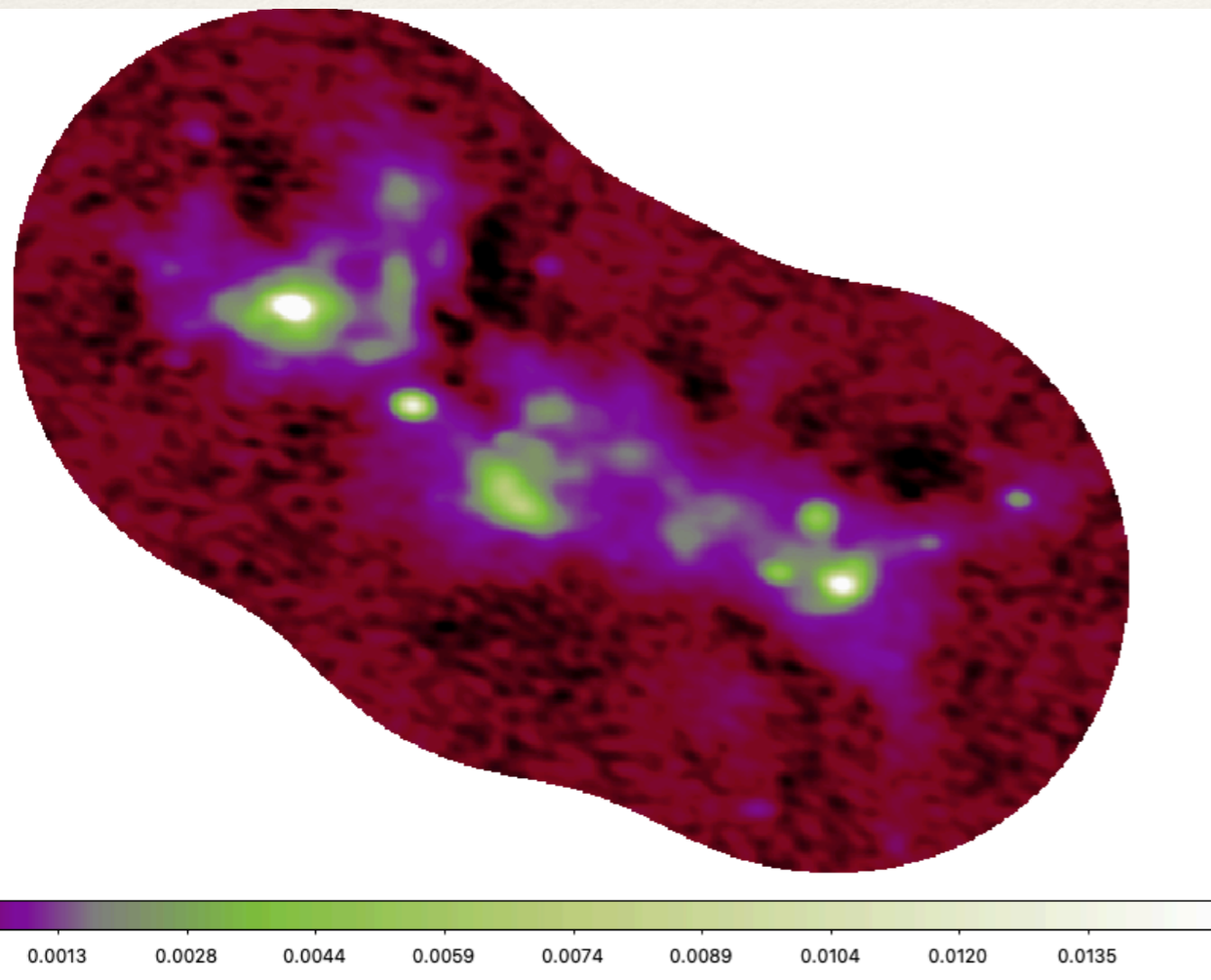
Thank you!



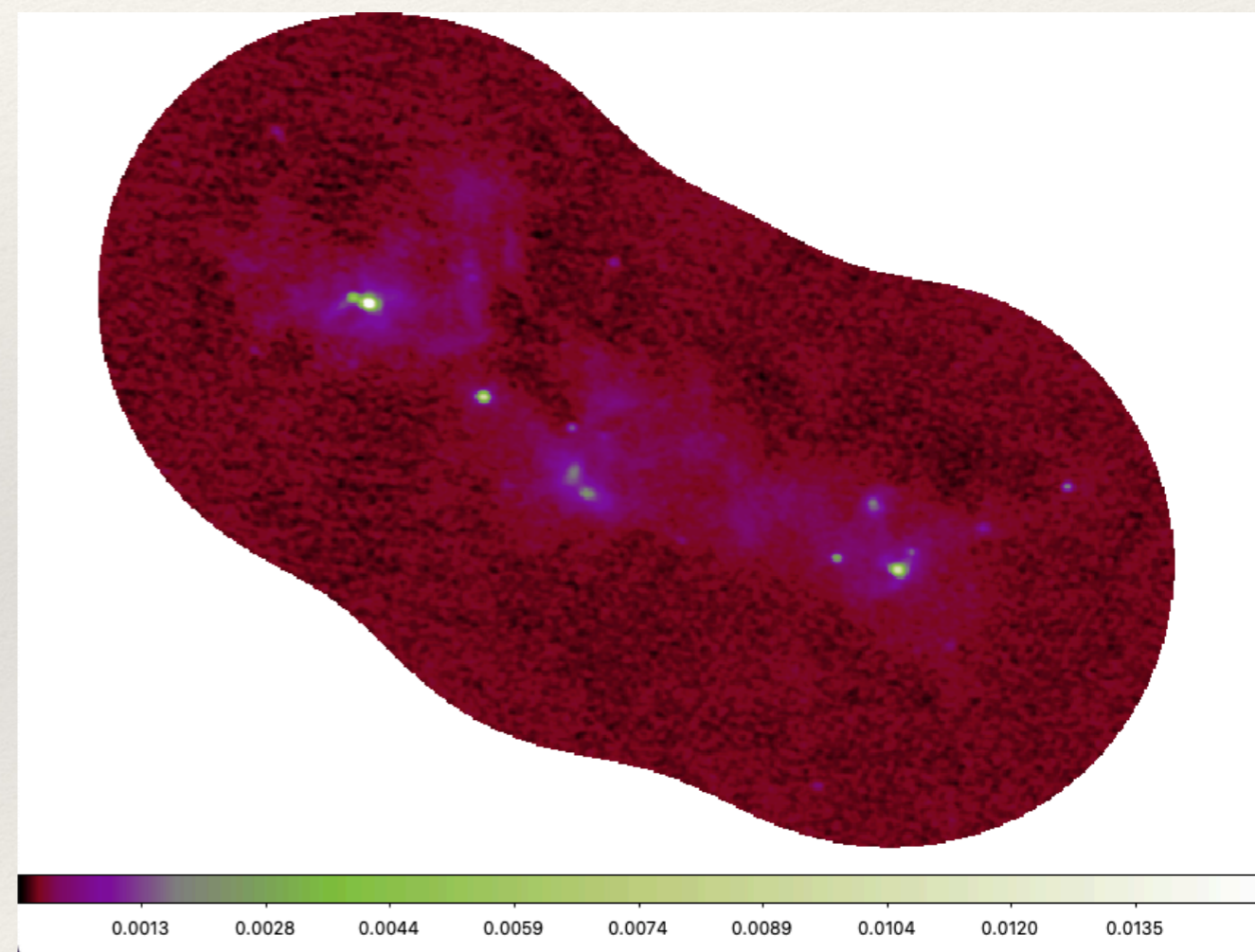
12m-array data only

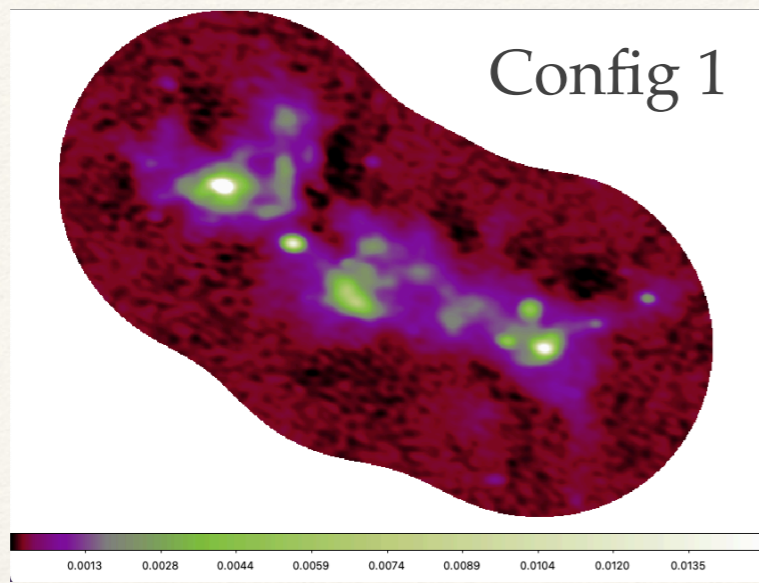
Stokes I images

Config 1

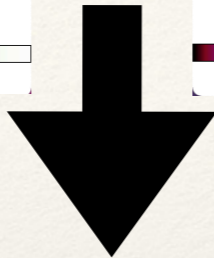
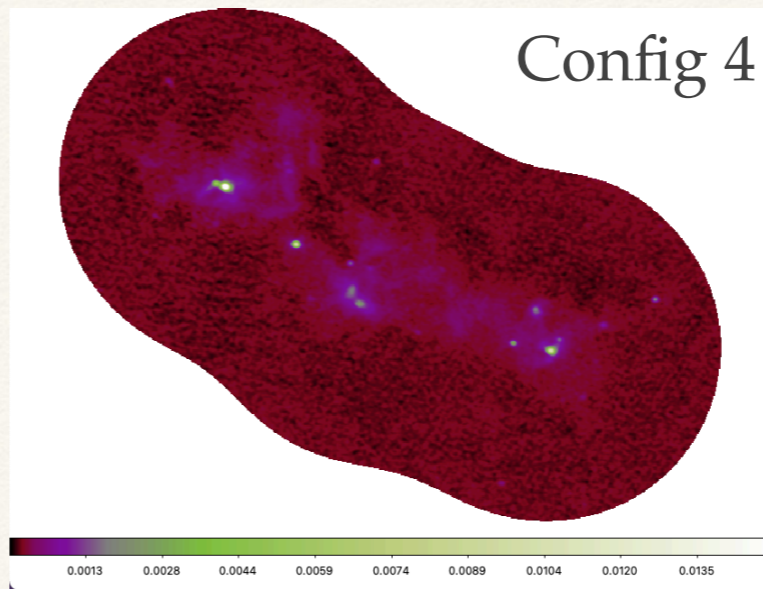


Config 4

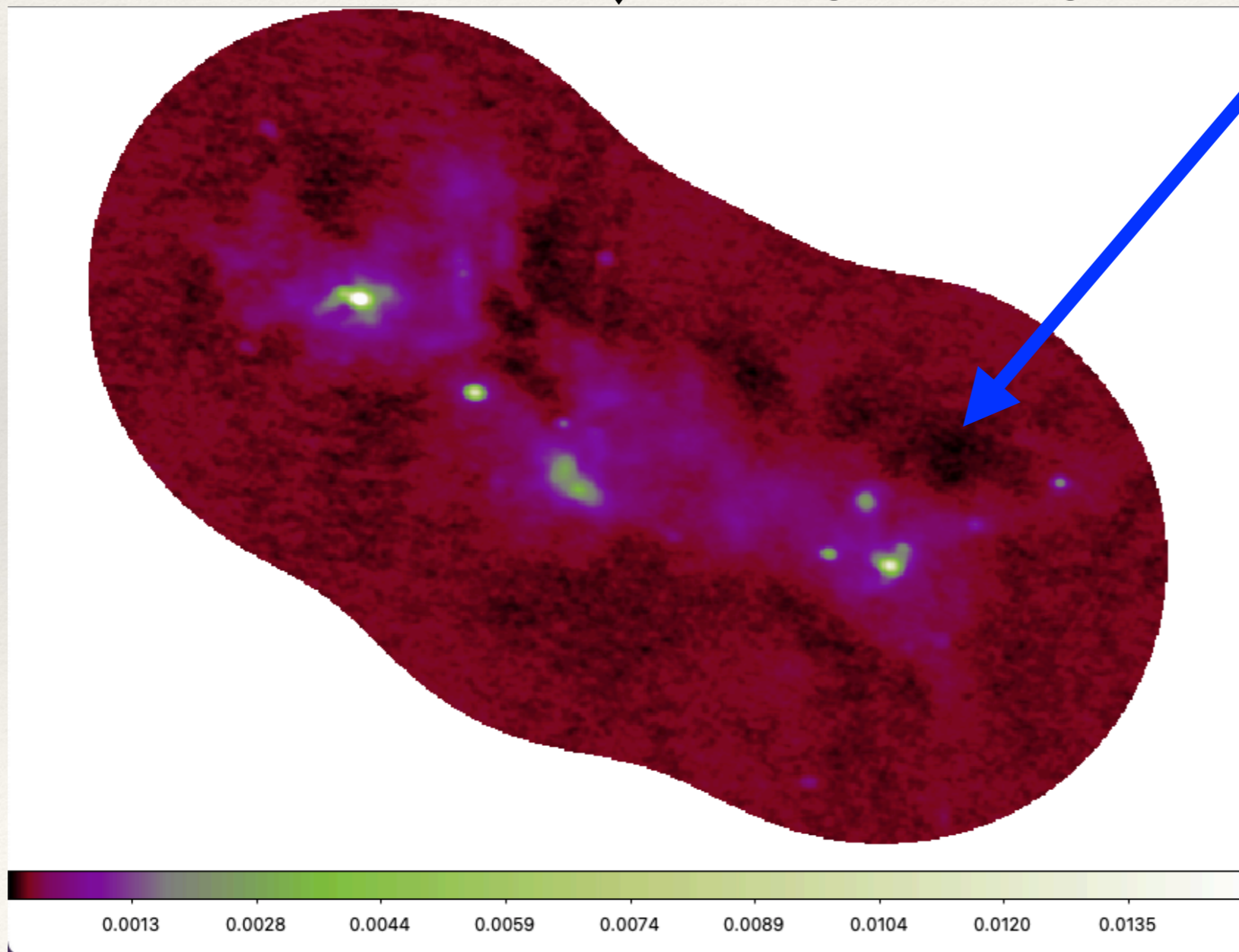




+

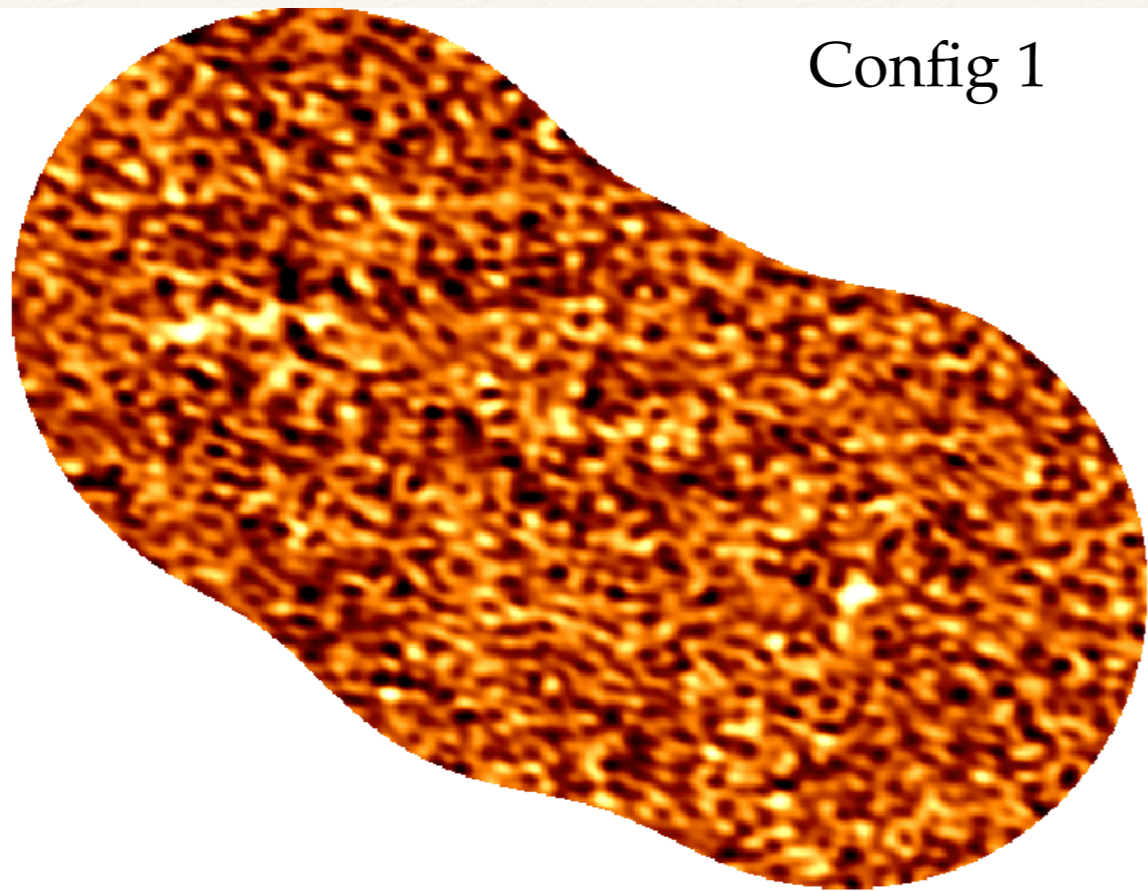


Config 1 + Config 4



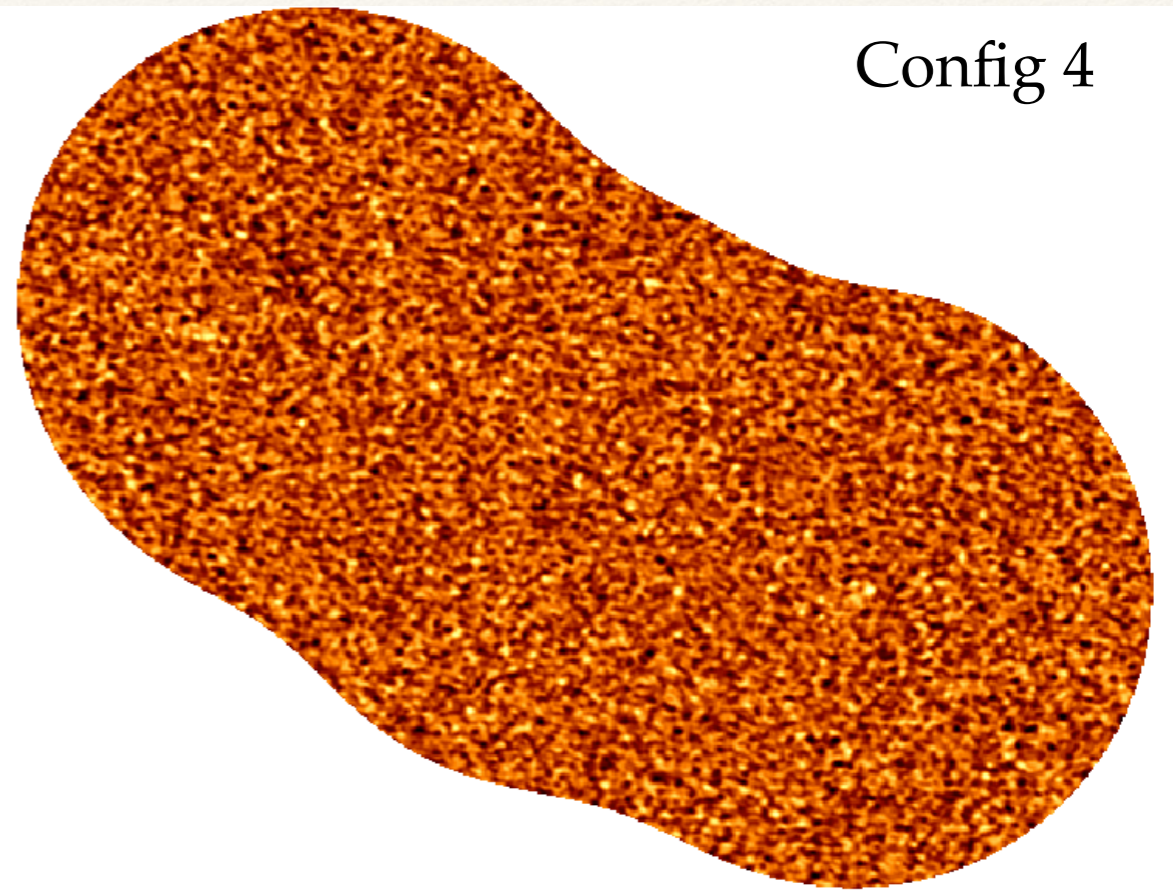
Negative
7m and TP are needed

Config 1



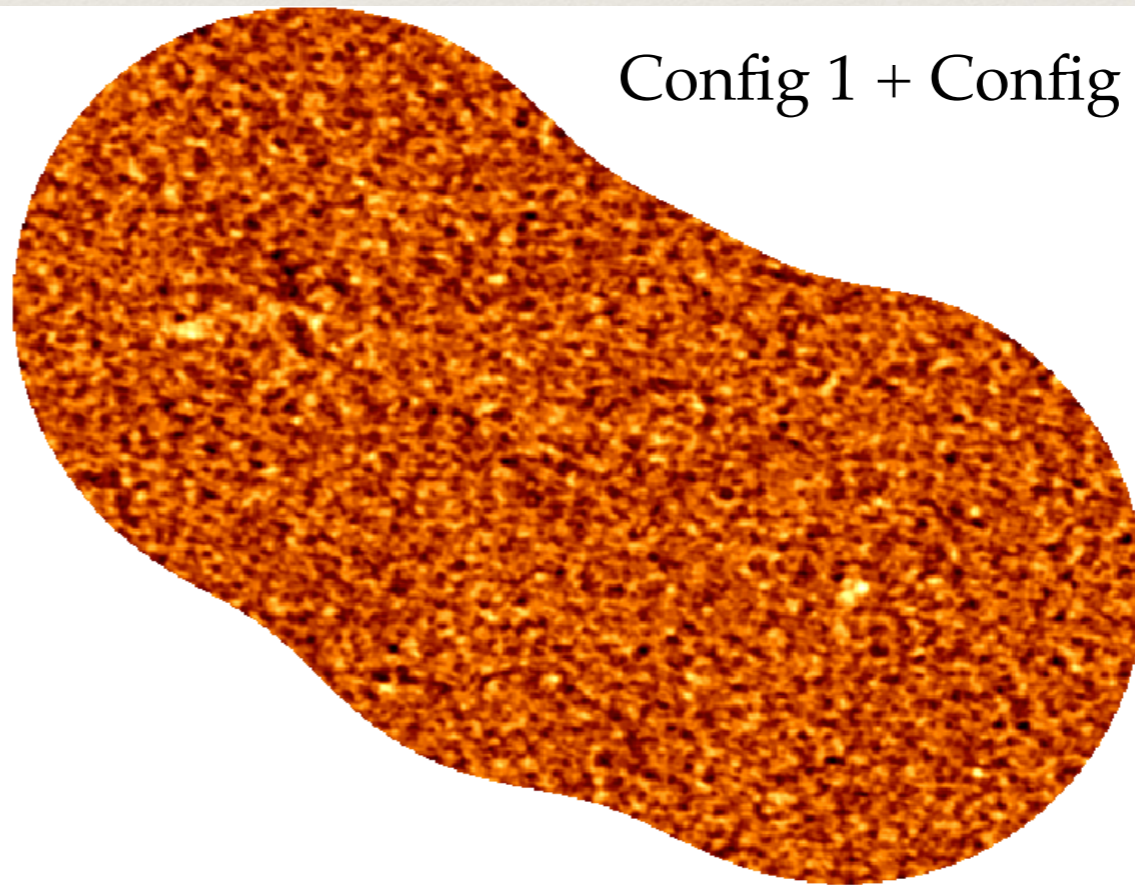
-7.51e-05 -5.01e-05 -2.50e-05 -4.89e-08 2.51e-05 5.00e-05 7.50e-05 1.00e-04 1.25e-04

Config 4



-7.51e-05 -5.01e-05 -2.50e-05 -4.89e-08 2.51e-05 5.00e-05 7.50e-05 1.00e-04 1.25e-04

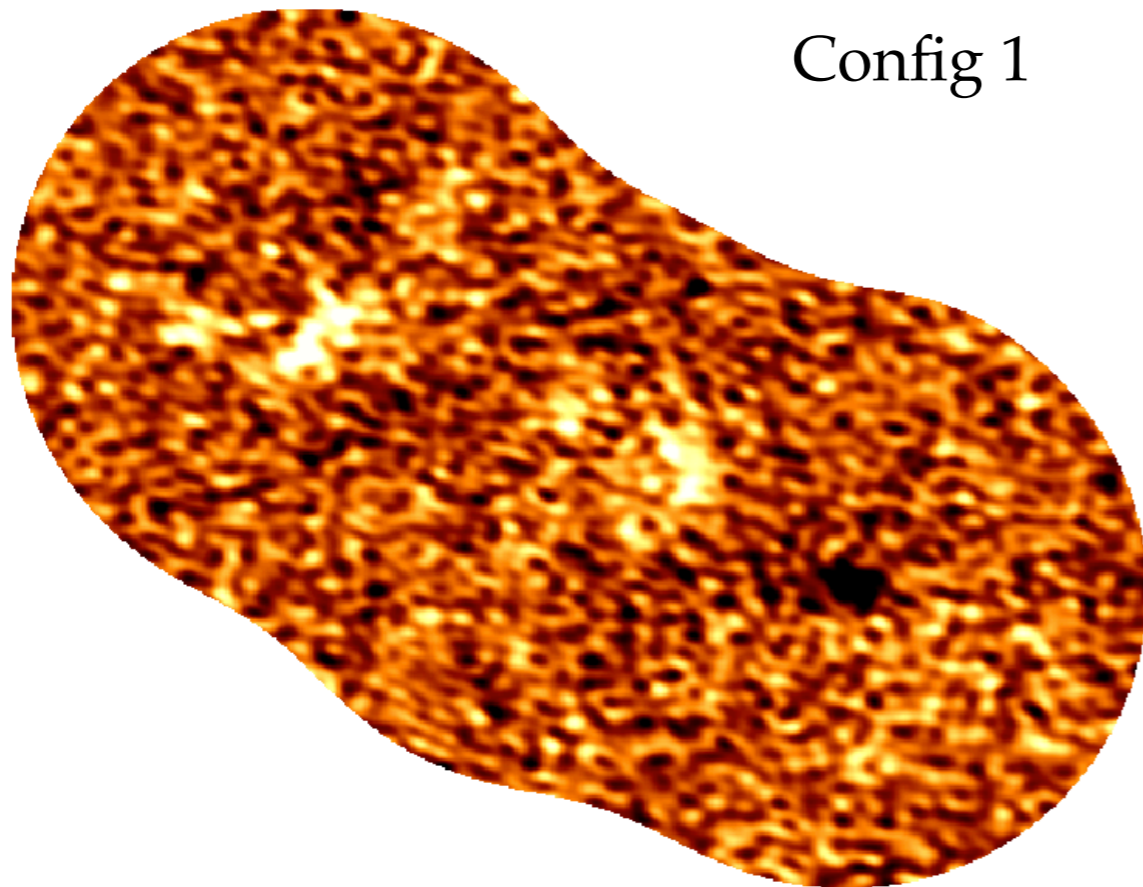
Config 1 + Config 4



-7.51e-05 -5.01e-05 -2.50e-05 -4.89e-08 2.51e-05 5.00e-05 7.50e-05 1.00e-04 1.25e-04

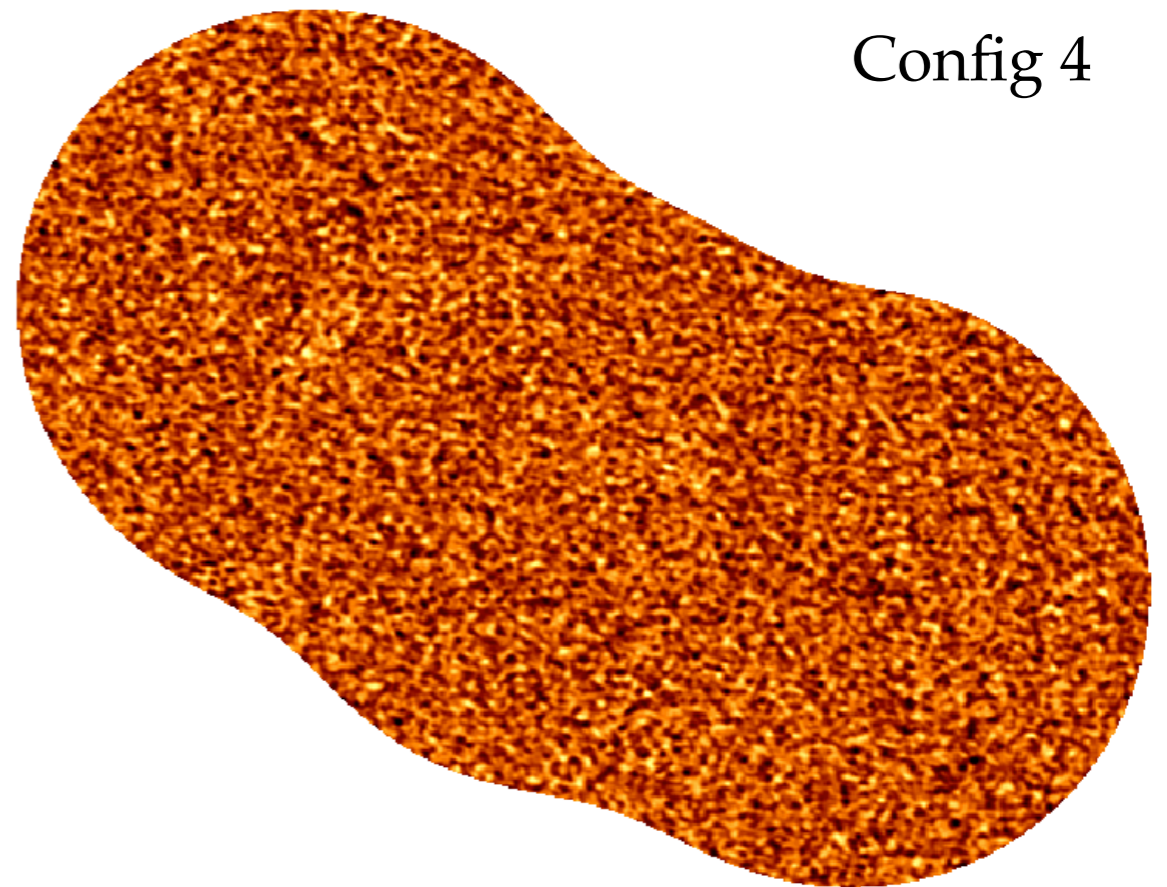
Stokes Q images

Config 1



-7.51e-05 -5.01e-05 -2.50e-05 -4.89e-08 2.51e-05 5.00e-05 7.50e-05 1.00e-04 1.25e-04

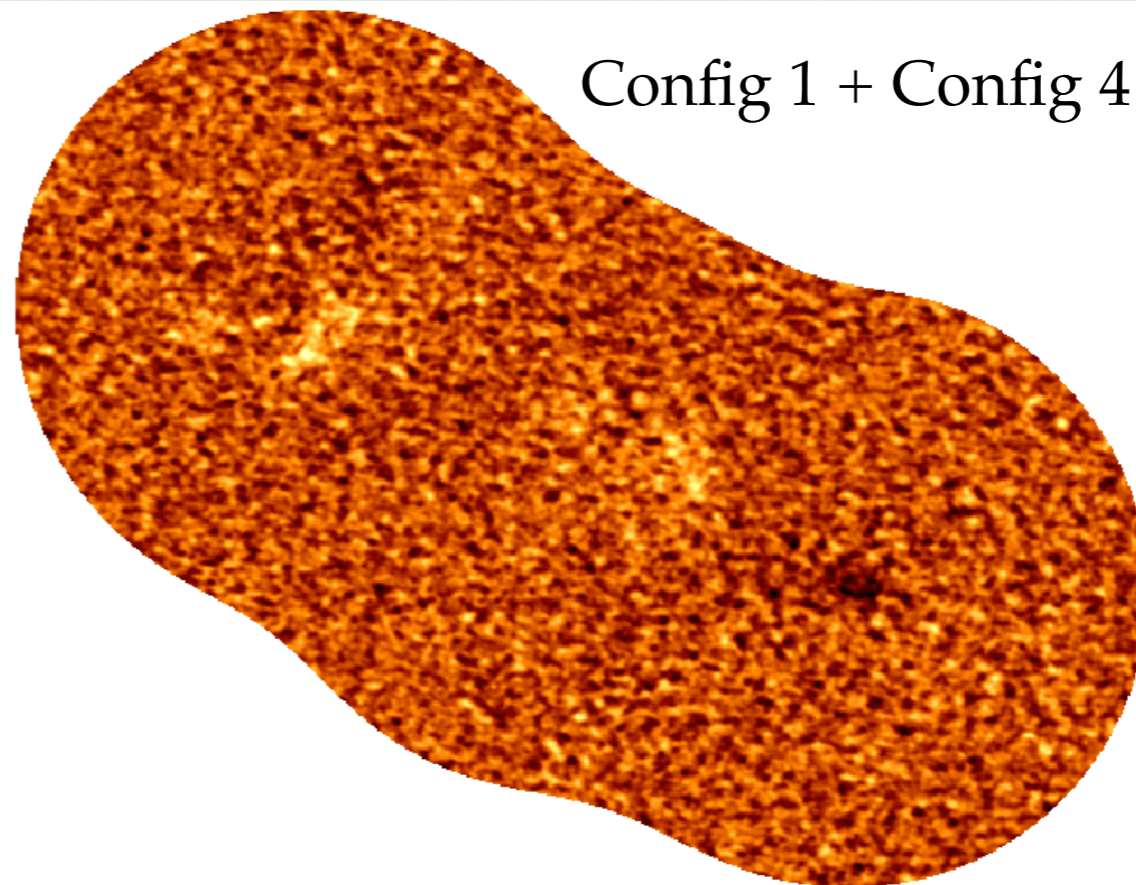
Config 4



-7.51e-05 -5.01e-05 -2.50e-05 -4.89e-08 2.51e-05 5.00e-05 7.50e-05 1.00e-04 1.25e-04

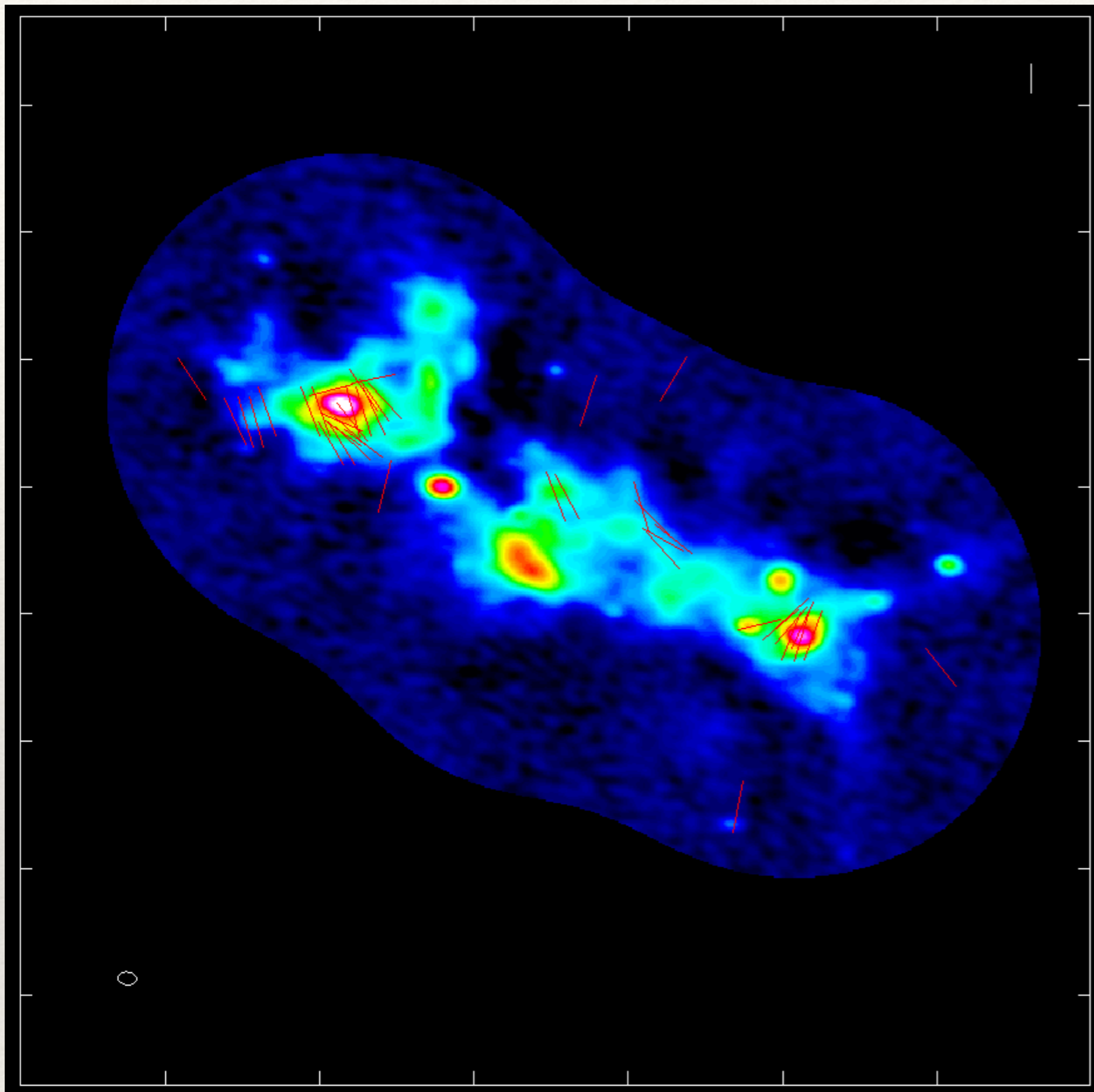
Stokes U images

Config 1 + Config 4

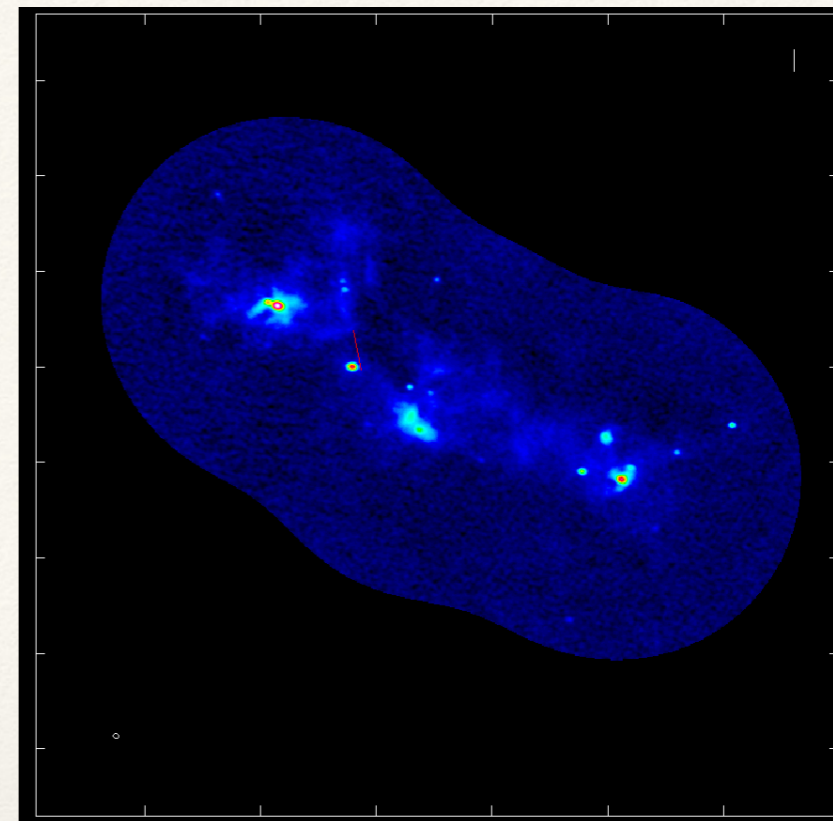


-7.51e-05 -5.01e-05 -2.50e-05 -4.89e-08 2.51e-05 5.00e-05 7.50e-05 1.00e-04 1.25e-04

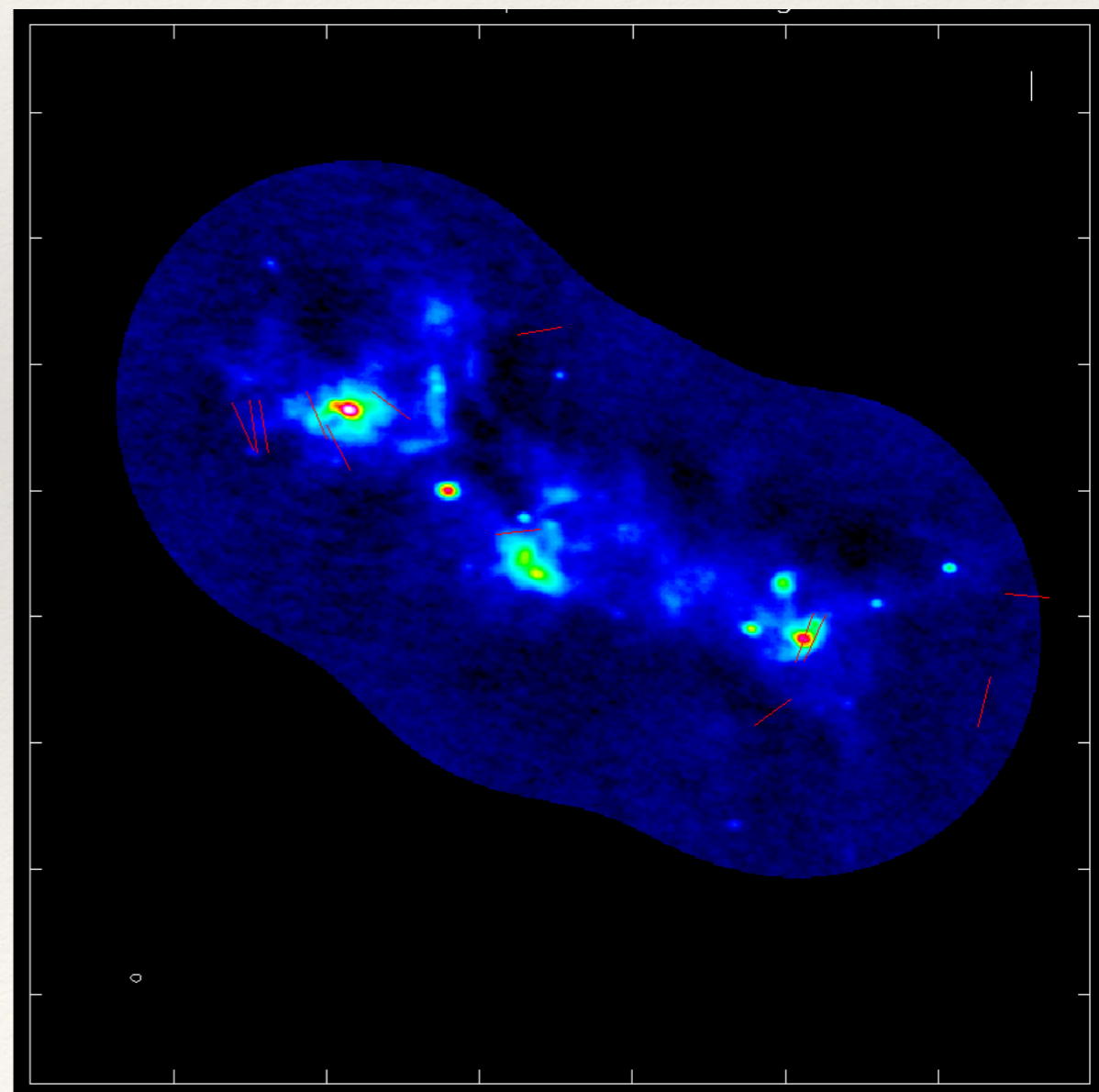
Config 1

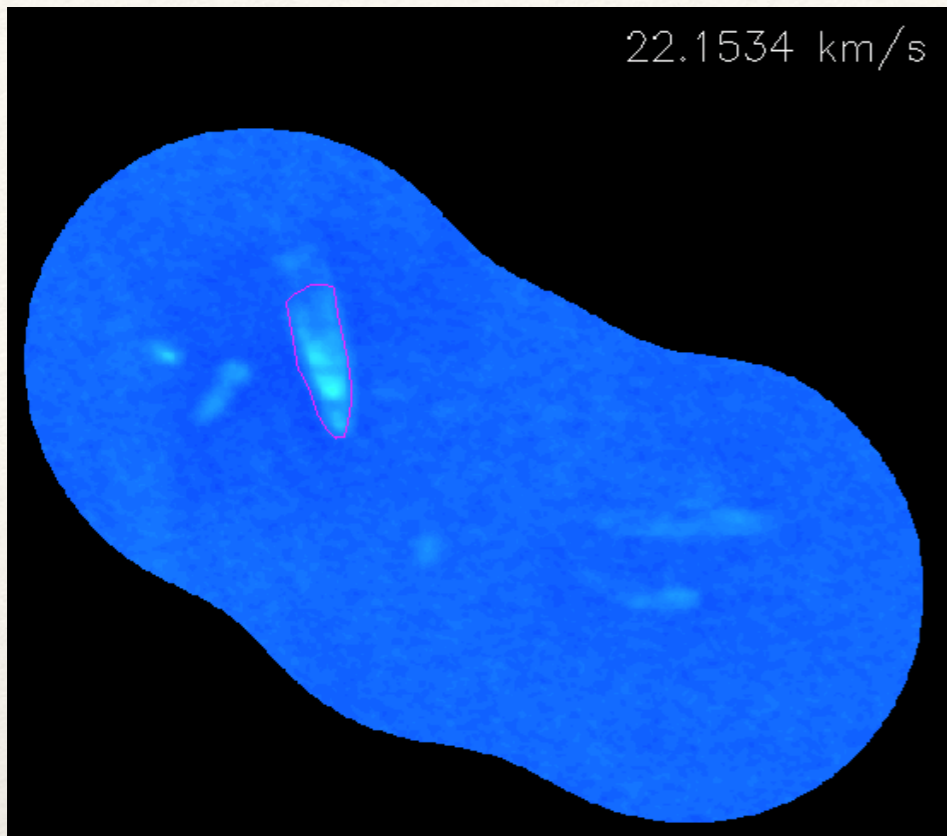


Config 4



Config 1 + Config 4





CO 2-1 line emission

