

2017 ALMA Summer School

Group 4: Imaging of Serpens South

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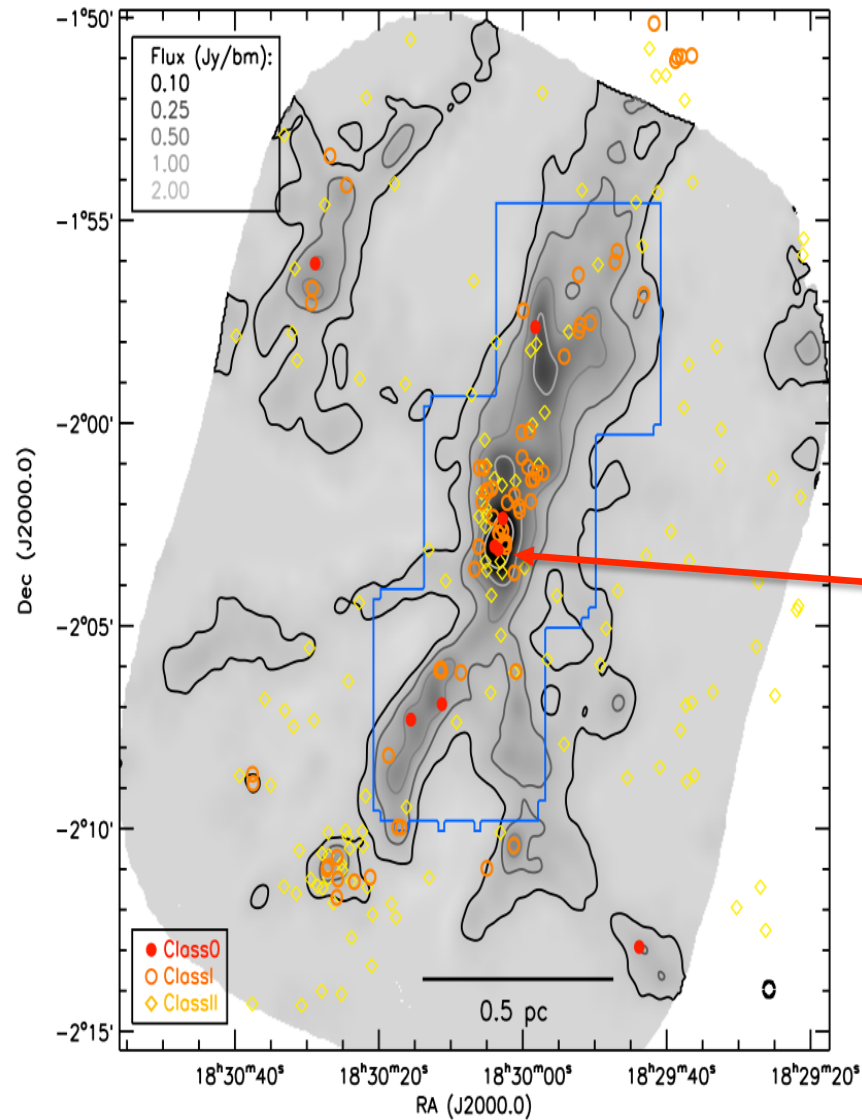
2017. 8. 25

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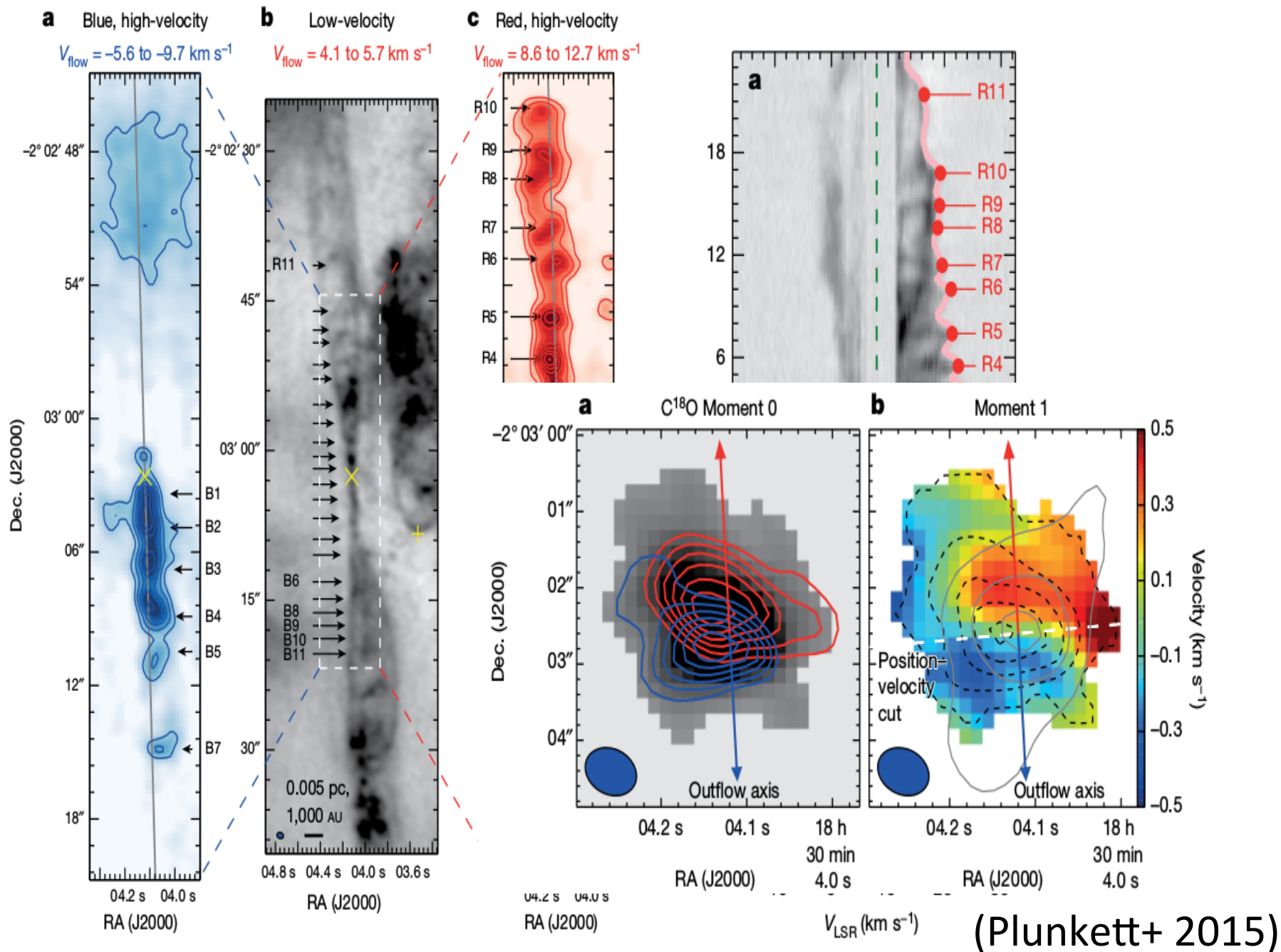
1. Introduction of Serpens South

Serpens
South



Carma-7

(Kirk+ 2013)



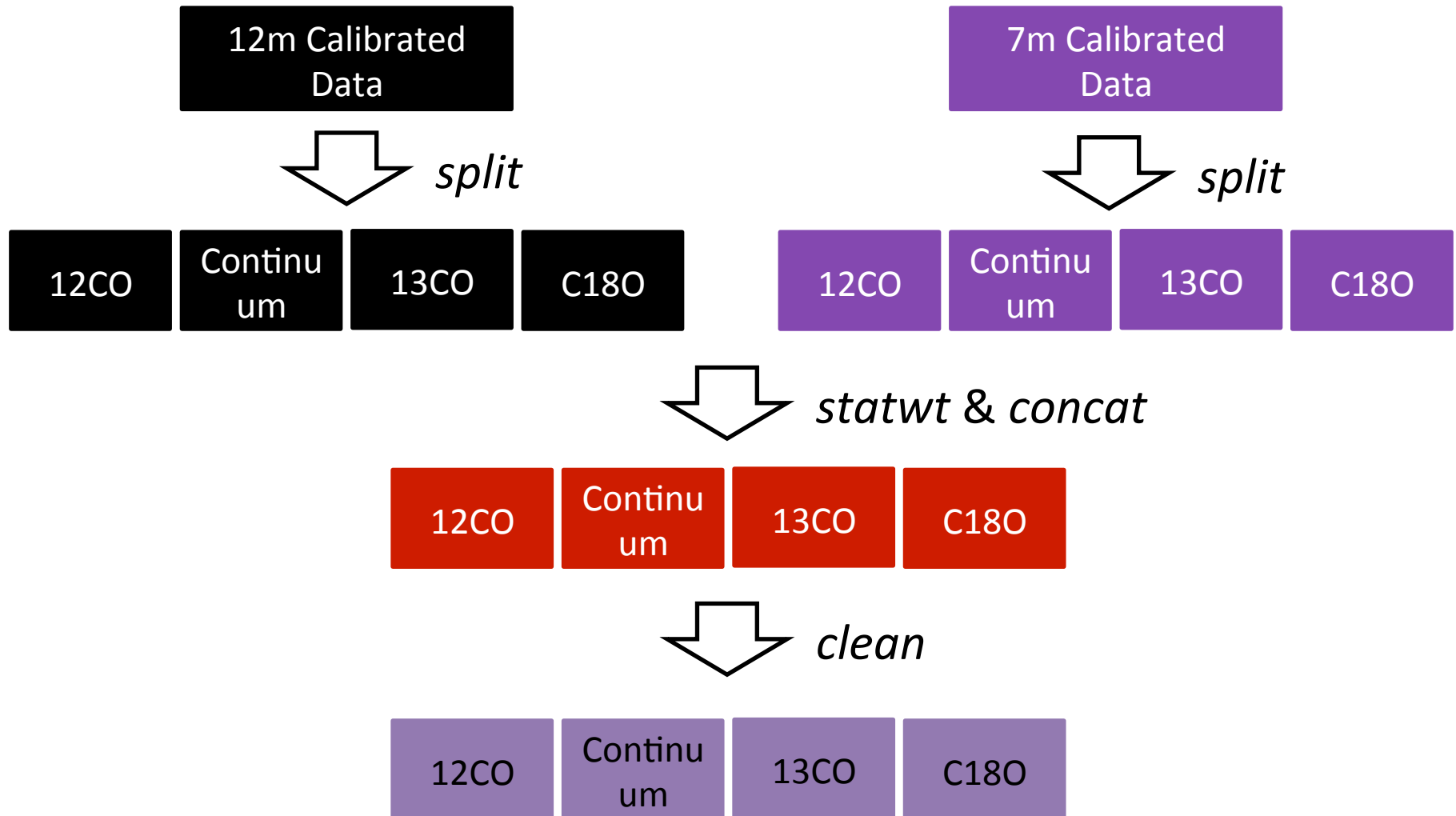
2. ALMA Observations

- 12m + 7m + TP
- Obs. Band: 6 (~243 GHz; ~1.25 mm)
- FOV (total): 2' x 3'
- # of pointing: 137 & 53 points
- Int. time: 2 & 5 min
- Receiver setting

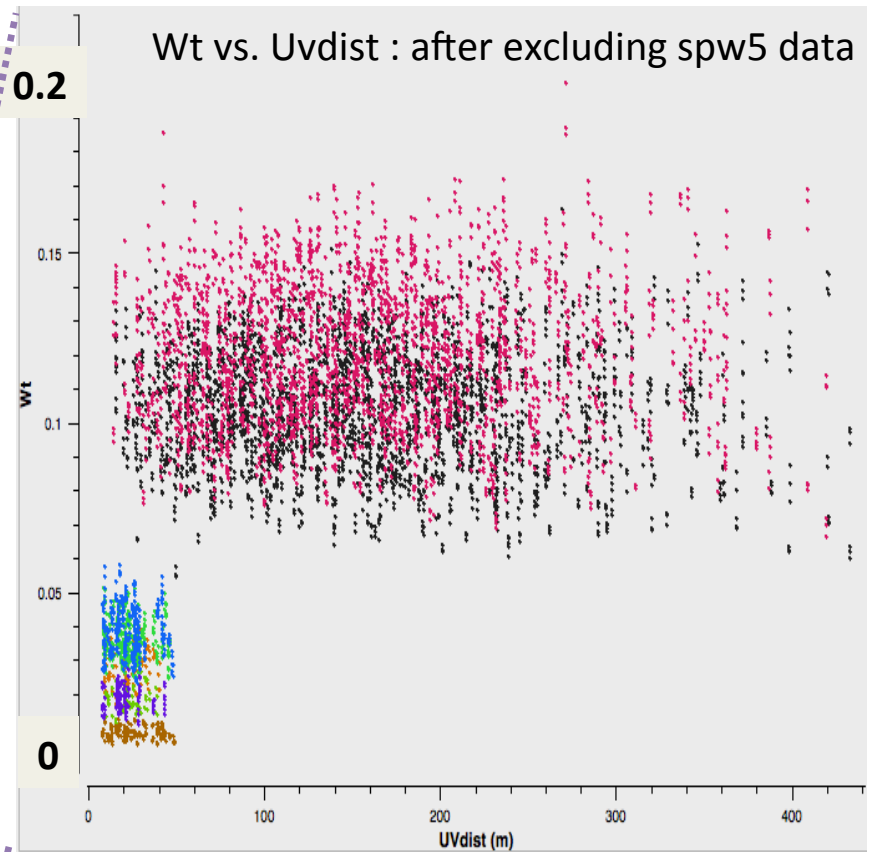
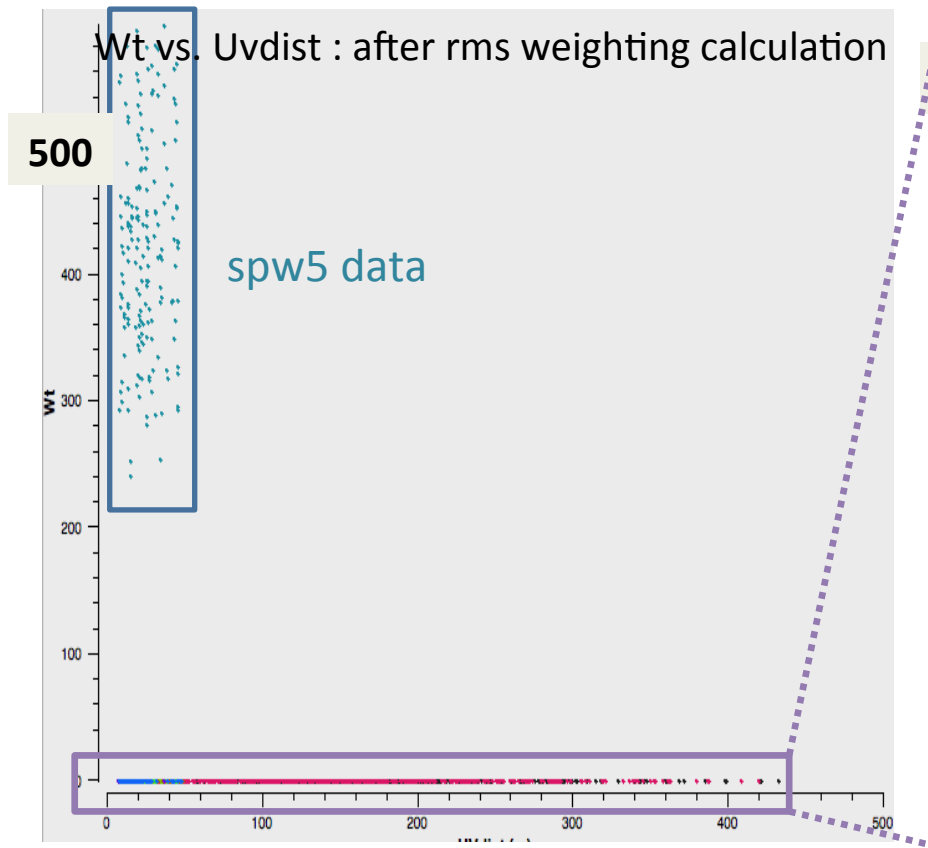
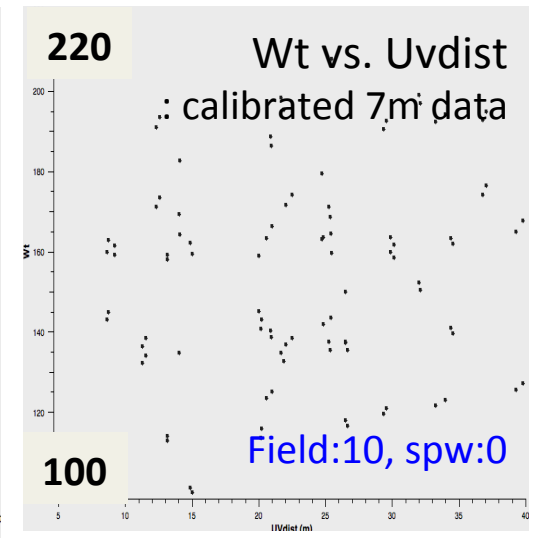
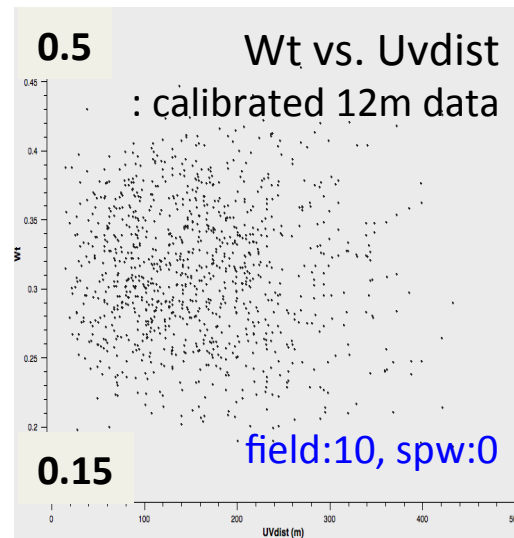
Line	C18O(2-1)	13CO(2-1)	12CO(2-1)	Continuum
Central Freq.	219.6 GHz	220.4 GHz	230.5 GHz	231.45 GHz
Band width	234 MHz	234 MHz	234 MHz	468 MHz
Channel Res.	61 kHz	61 kHz	61 kHz	122 kHz
# of Channel	3840	3840	3840	3840

LO

3. Flow-Chart of Imaging Process

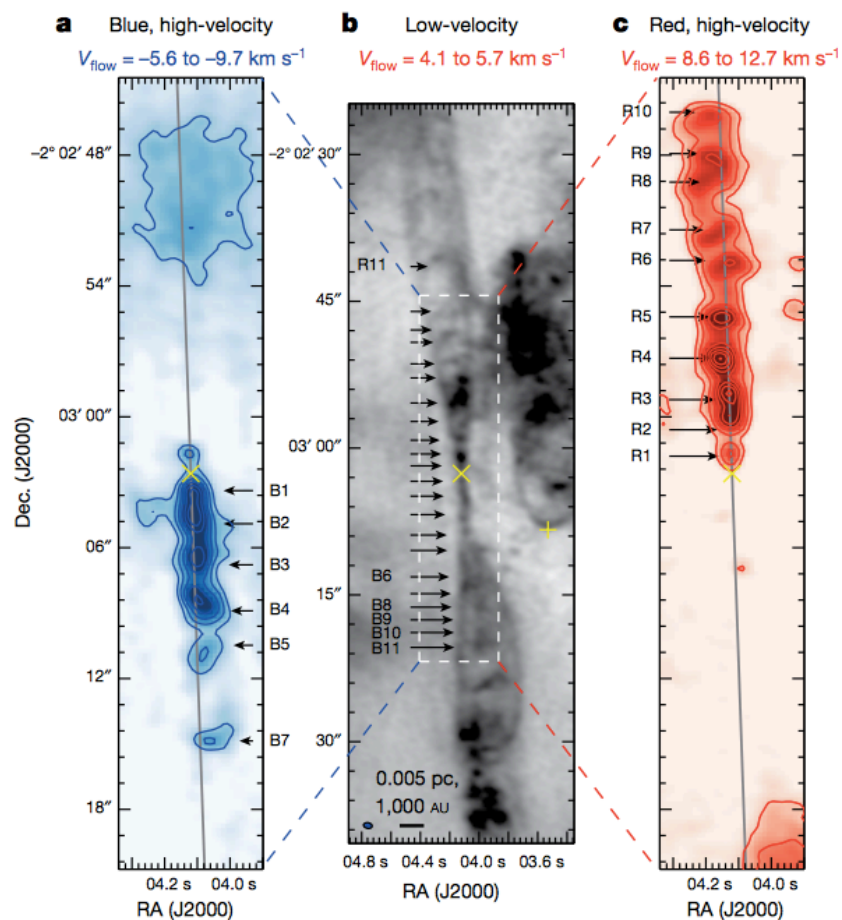


Weighting Check before combining 12m and 7m data



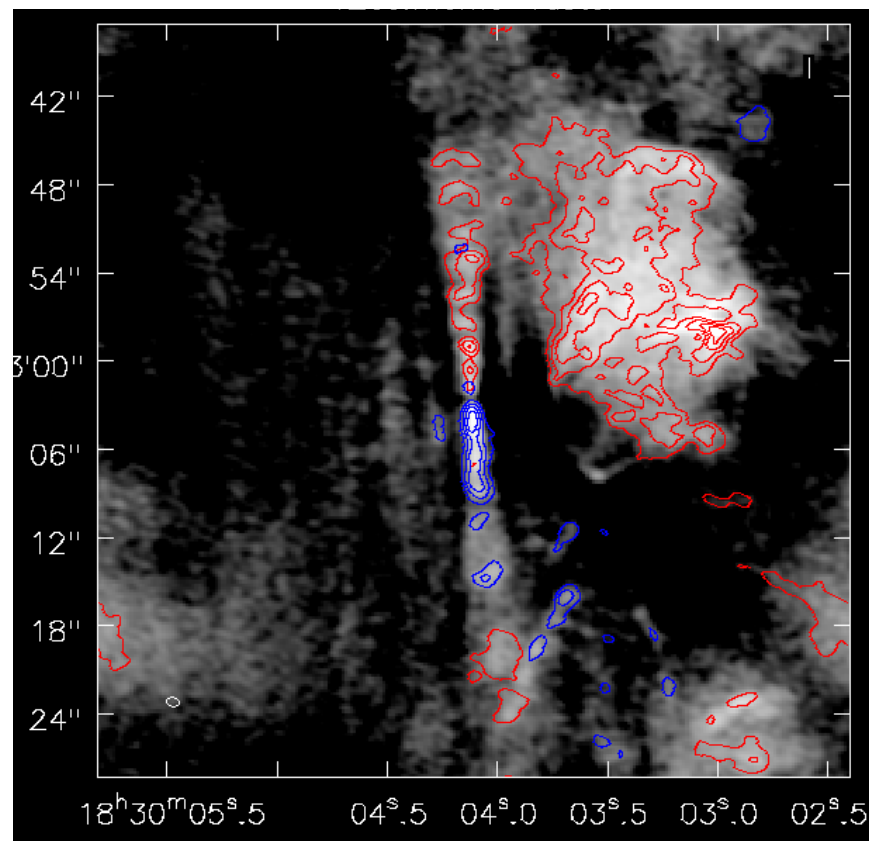
Episodic outflows in CARMA-7

- ^{12}CO (2-1): optically **thin** region



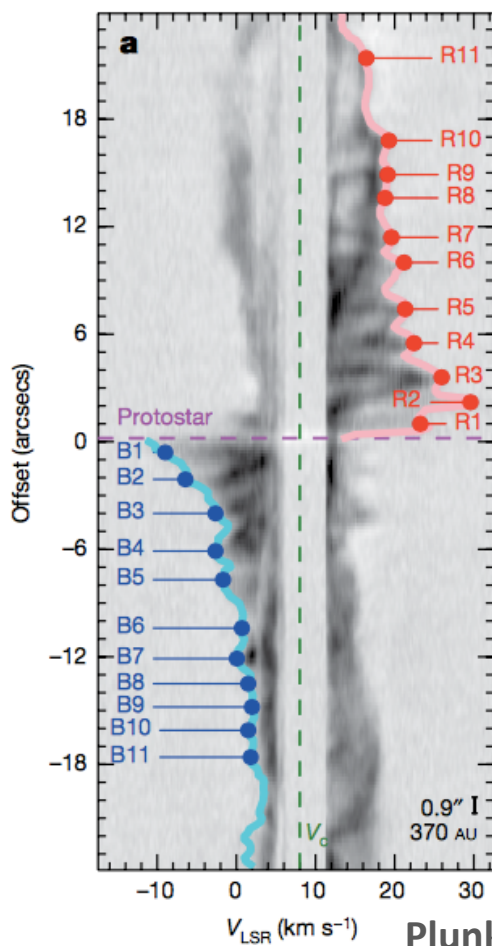
Plunkett et al. (2015)

Moment 0+1 map

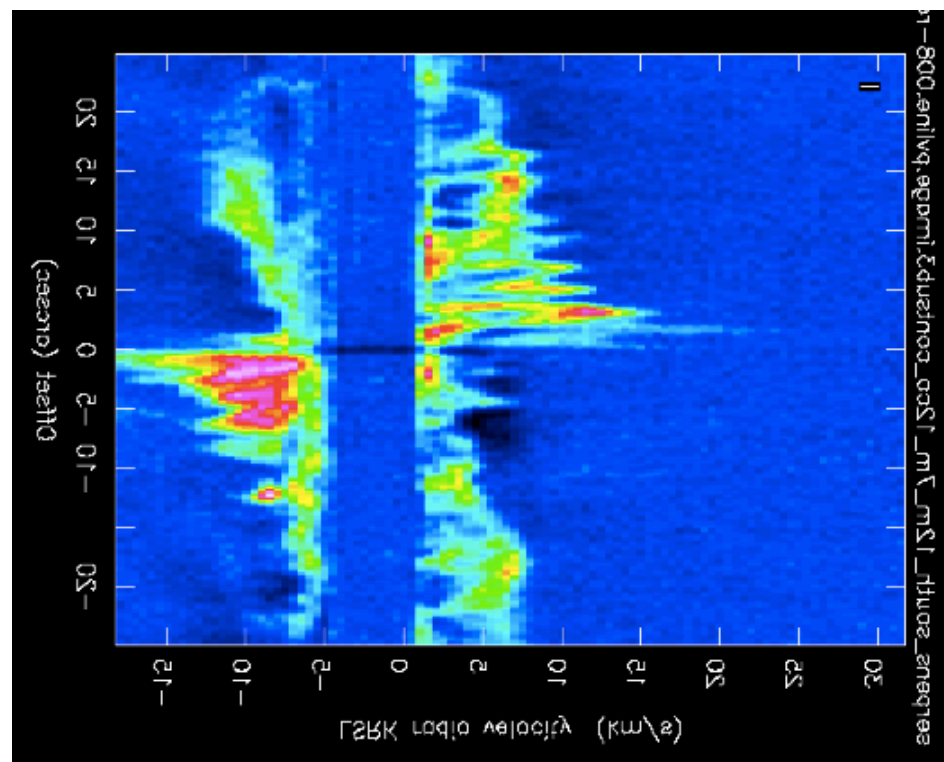


Episodic outflows in CARMA-7

- ^{12}CO (2-1): optically **thin** region



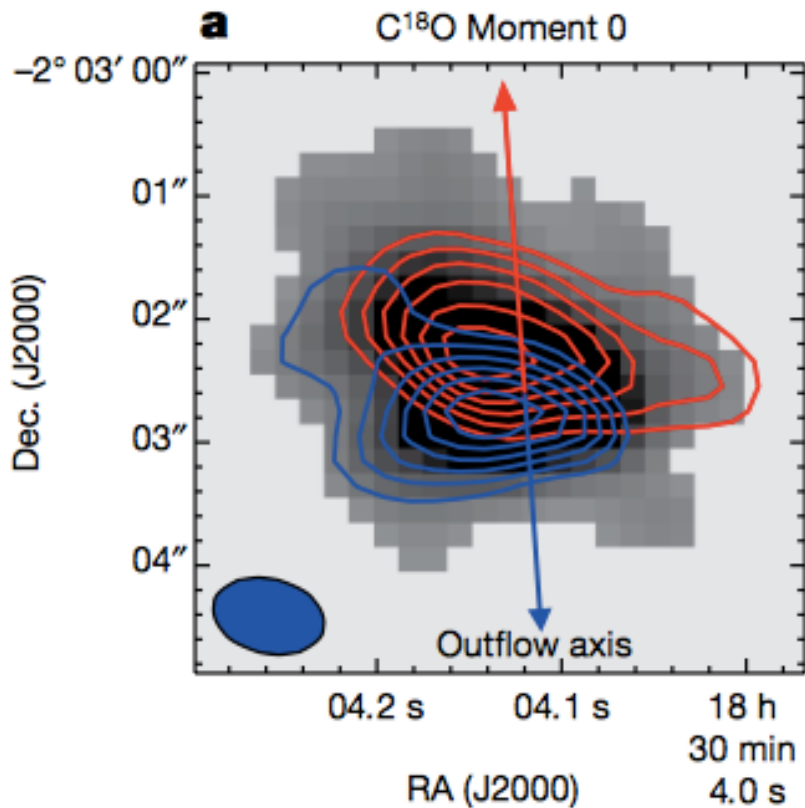
Position-Velocity Diagram



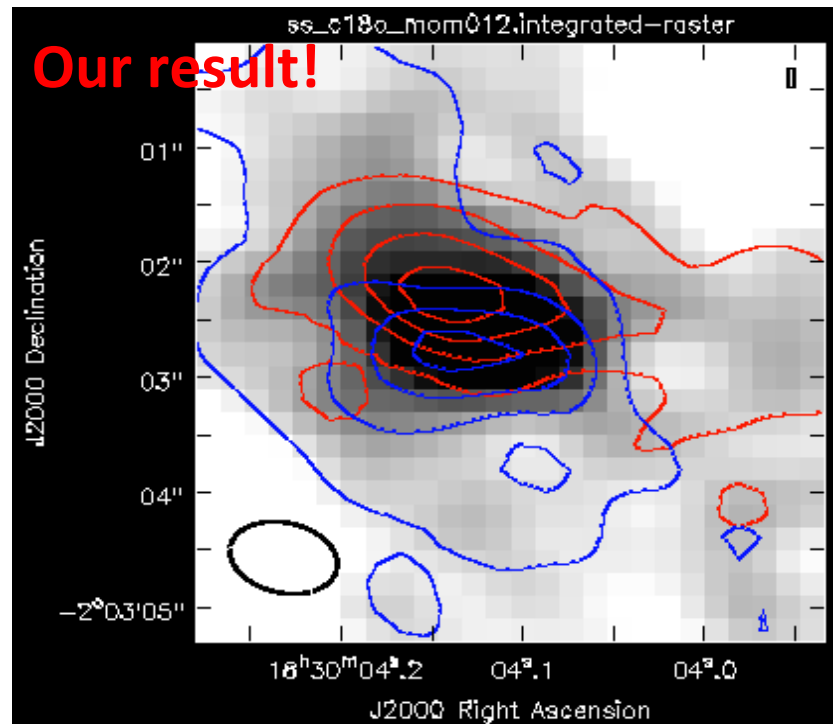
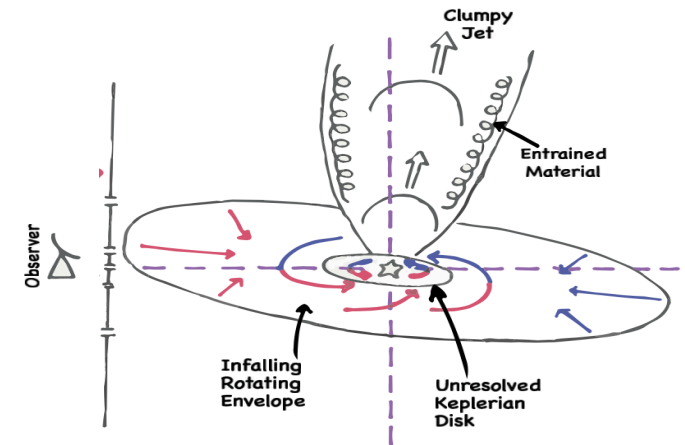
Plunkett et al. (2015)

Infalling envelope in CARMA-7

- C^{18}O (2-1): optically **thick** region

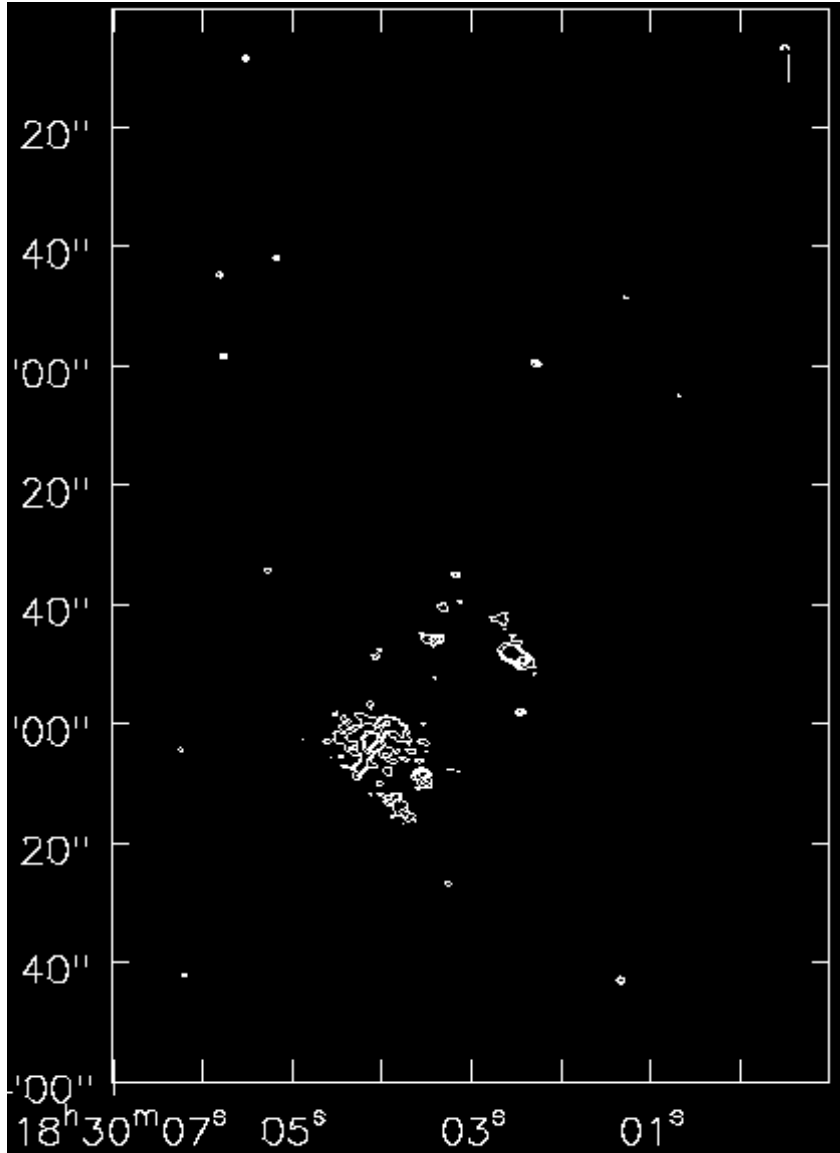


Plunkett et al. (2015)

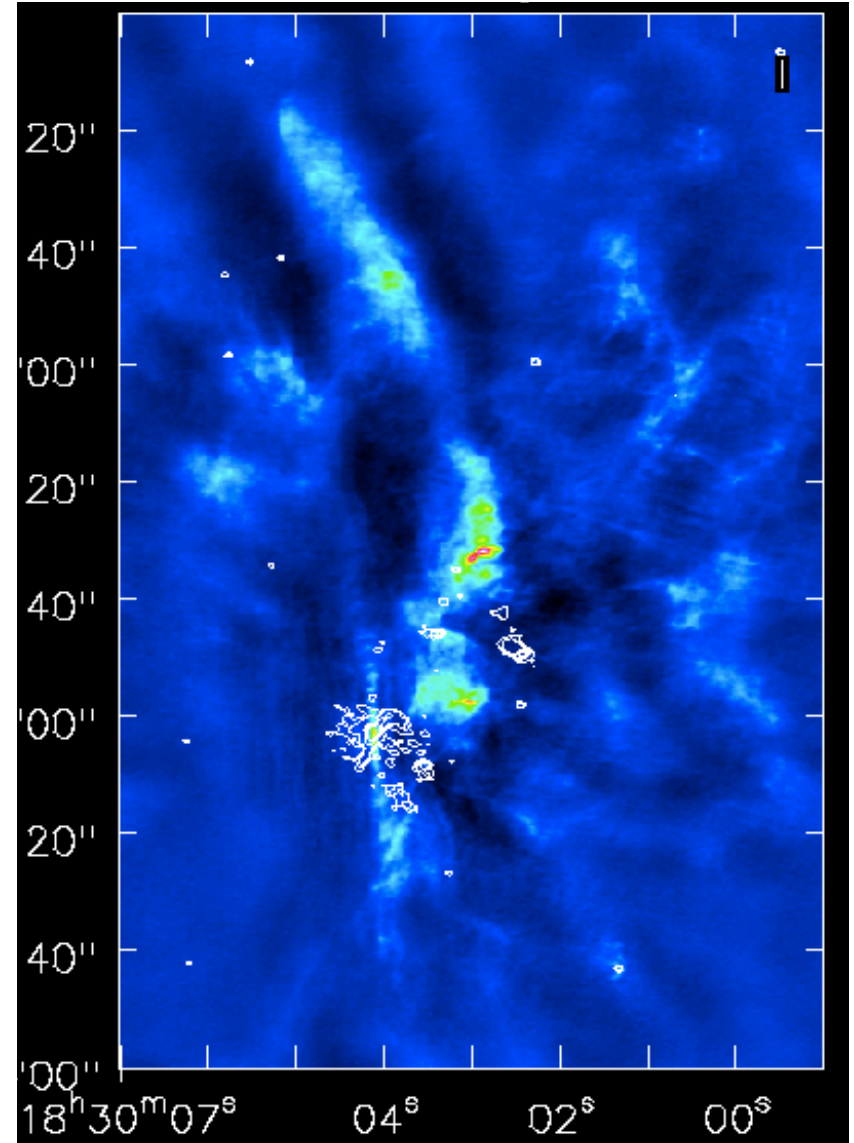


Serpens South wide field map

1.3mm continuum map (2'x3')

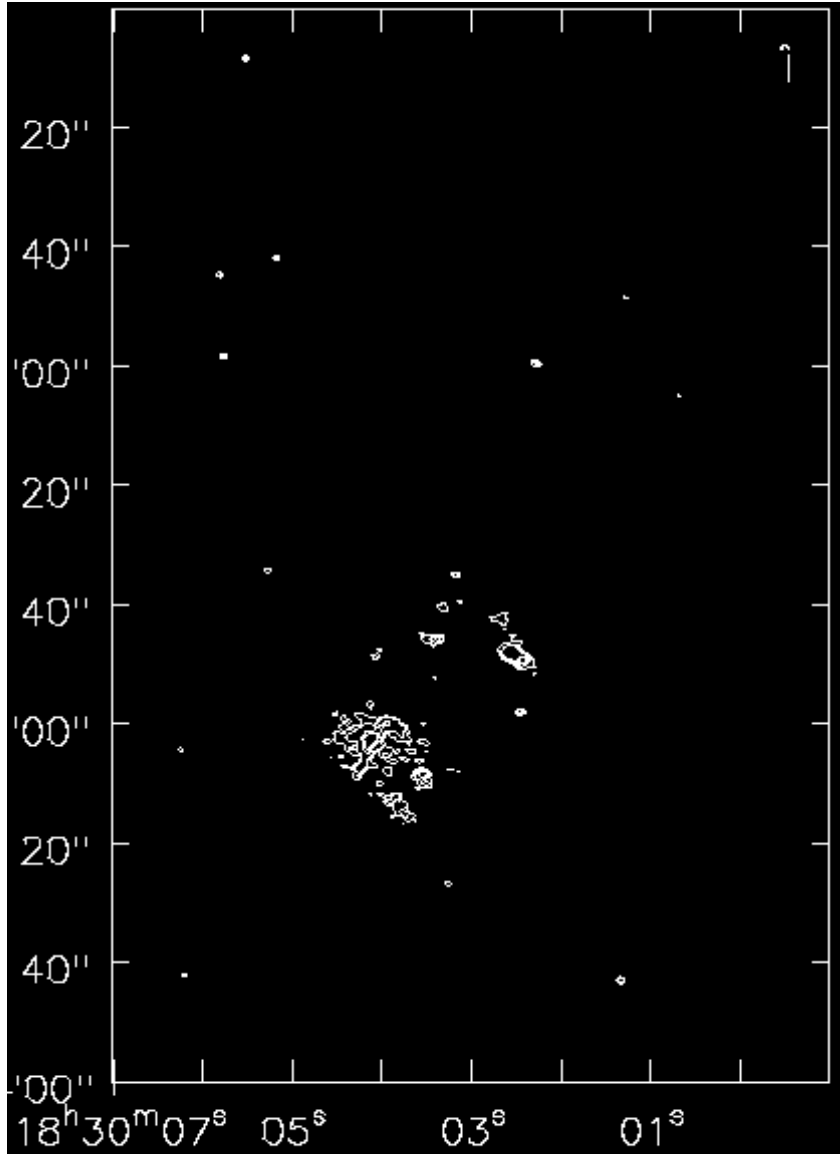


^{12}CO (2-1) map

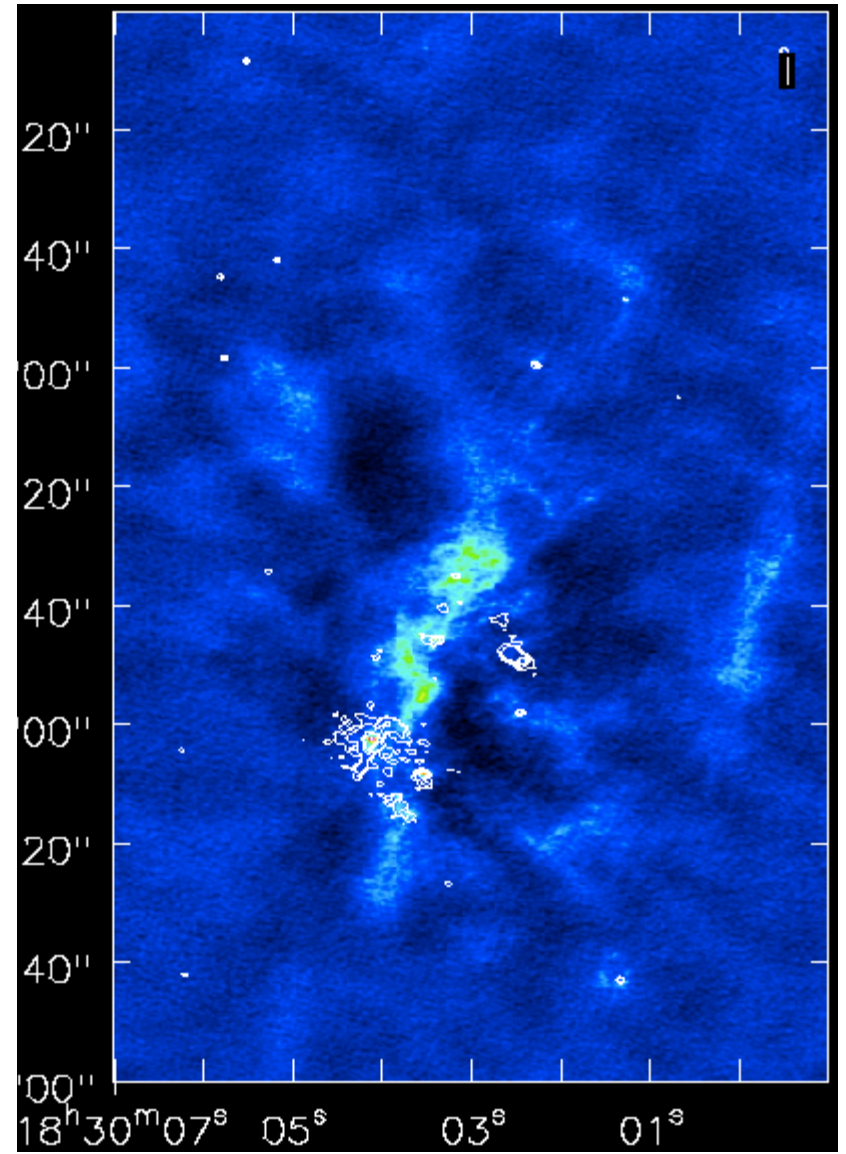


Serpens South wide field map

1.3mm continuum map (2'x3')

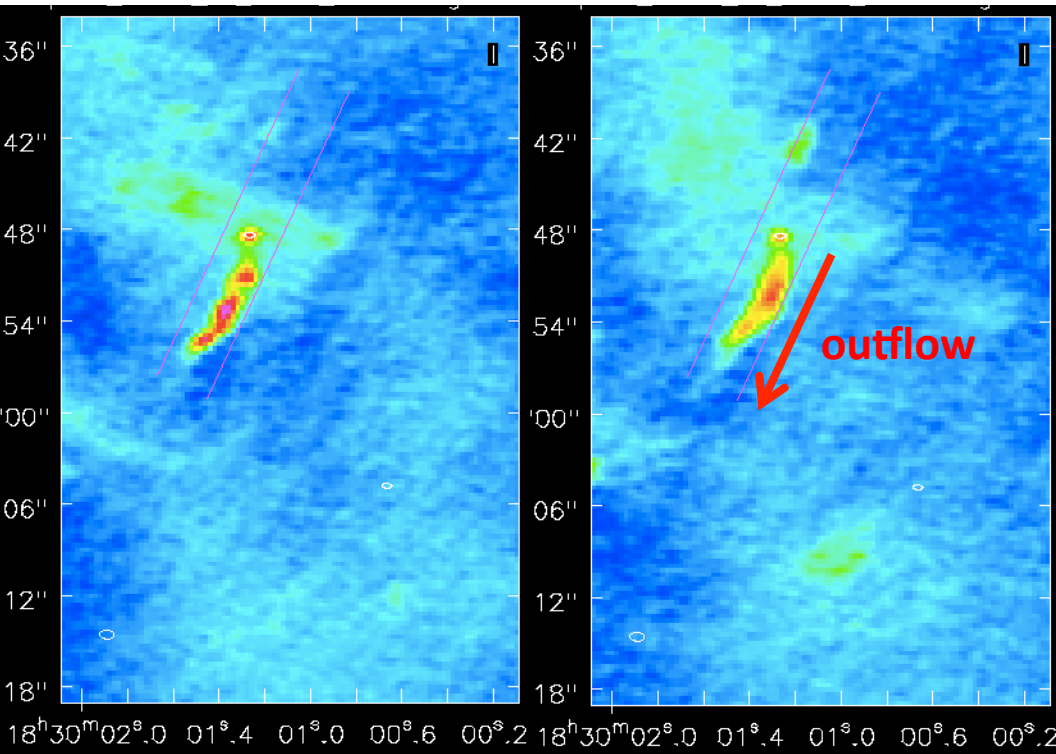


¹³CO (2-1) map

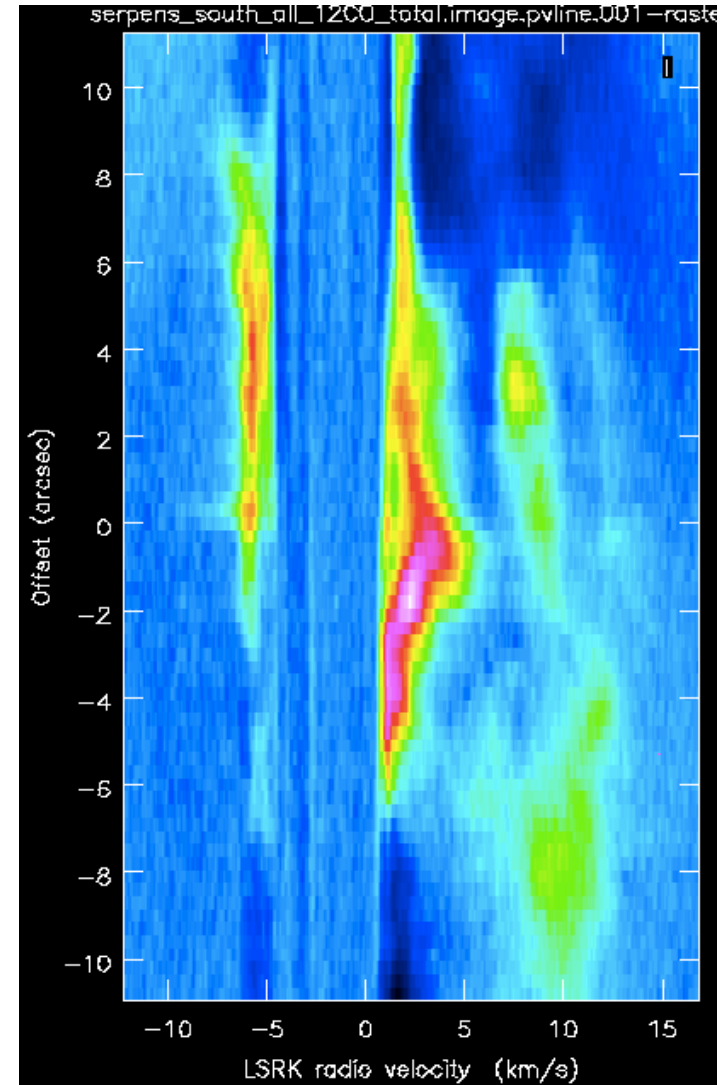


Serpens South wide field map

Newly found outflow



PV diagram



Concluding Remarks

- Dense protostellar cluster: Serpens South
- 12m array + ACA (7m) 합성
- Continuum + emission lines (^{12}CO , ^{13}CO , C^{18}O)
- Wide field (mosaic; $2' \times 3'$)
- 여름학교 이틀간 배운 내용으로 논문과 유사한 결과를 얻을 수 있었음
=> 이제 ALMA 아카이브 자료로 논문을 낼 수 있습니다!!