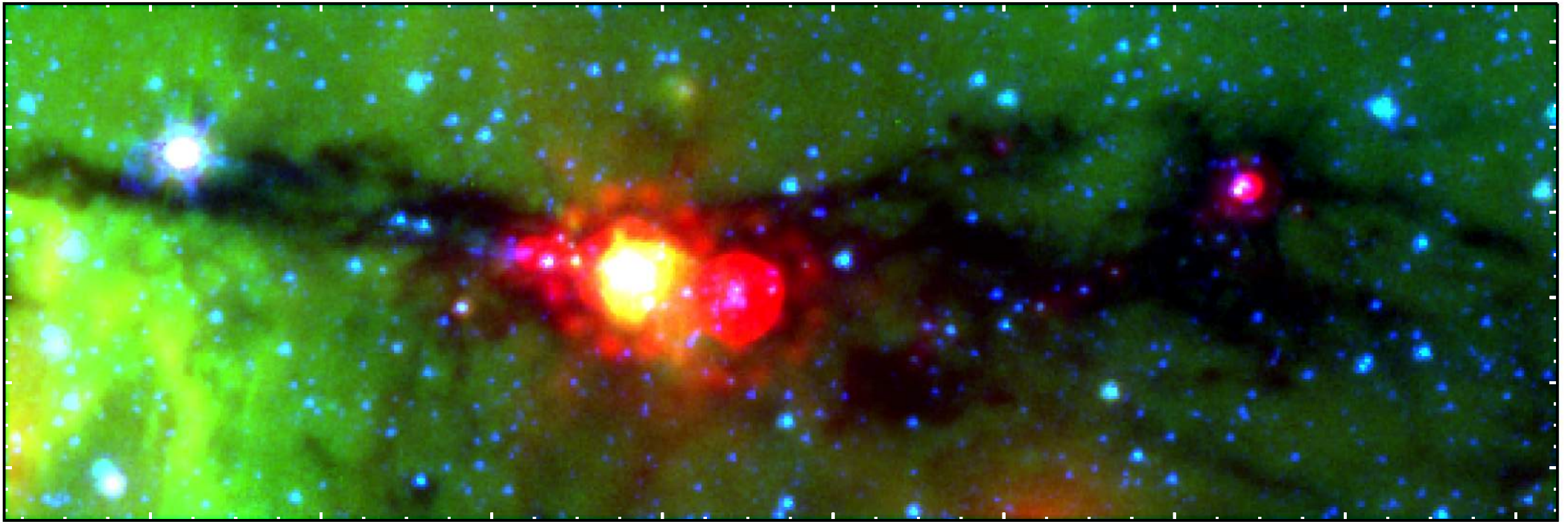


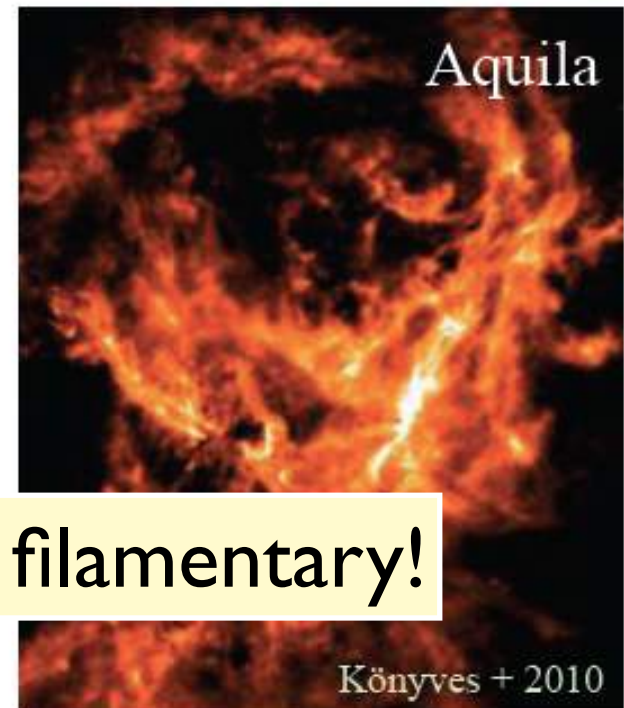
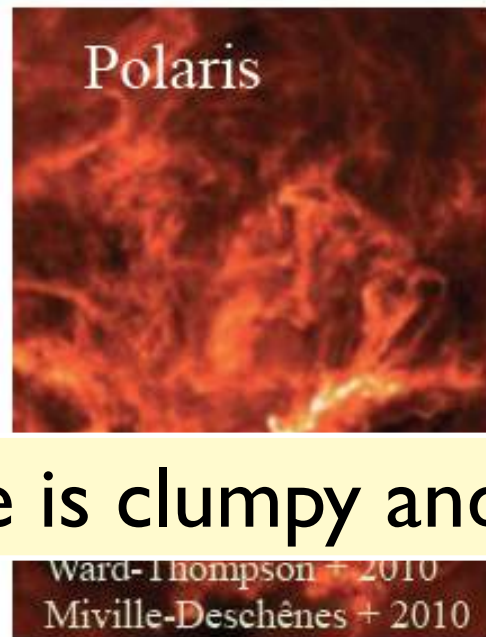
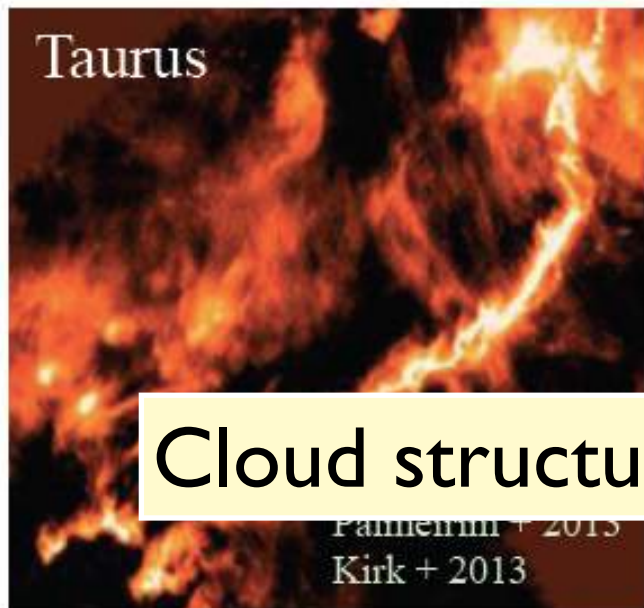
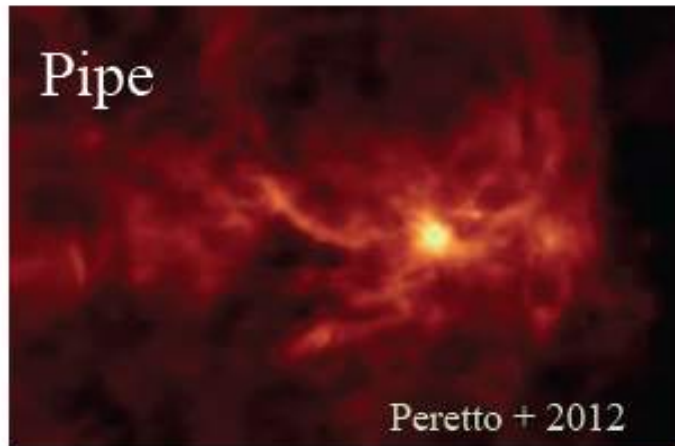
Dust Polarization in the Infrared Dark Cloud G34.43



Ya-Wen Tang

Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan (ASIAA)

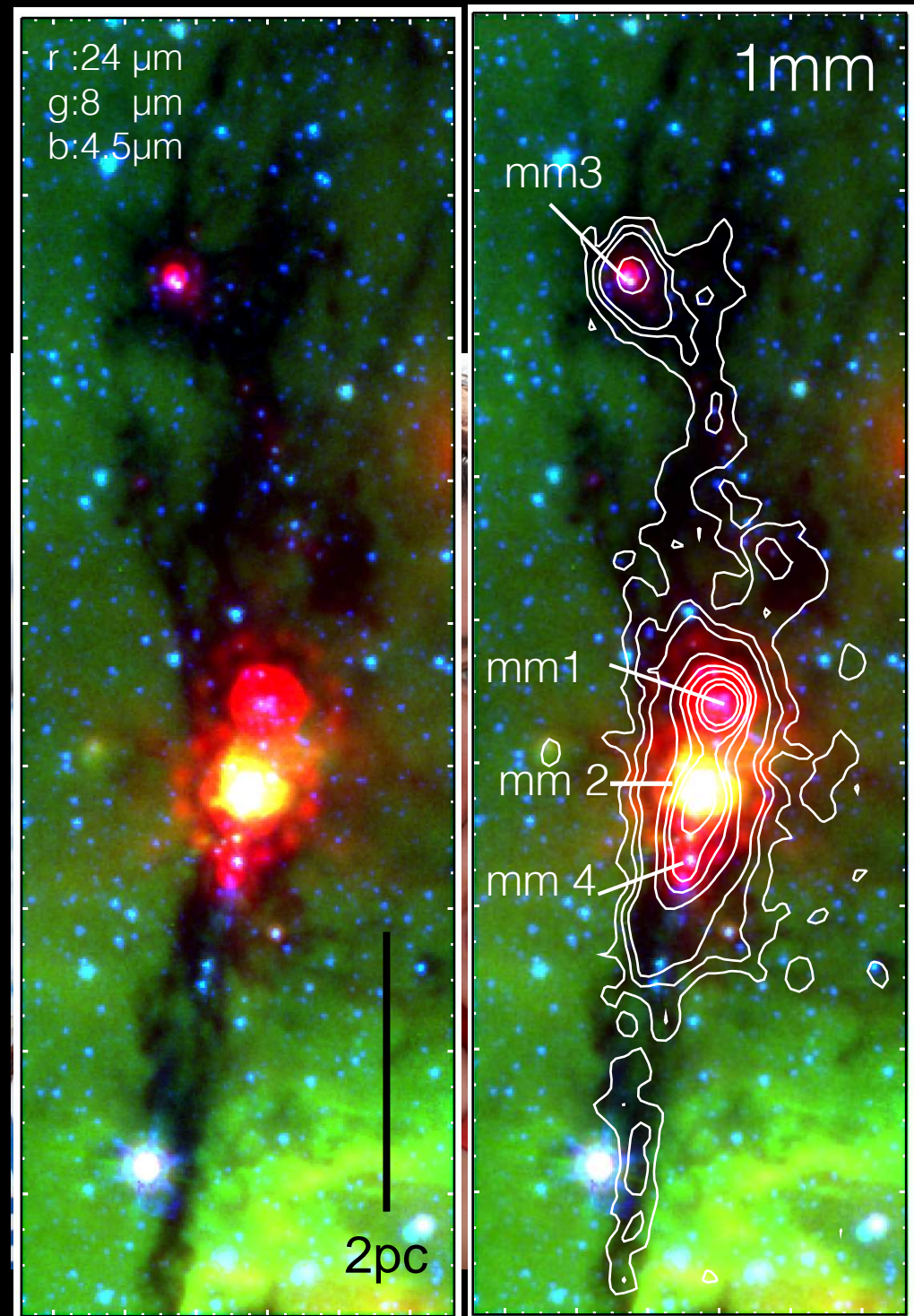
Herschel reveals
a “universal” filamentary
structure in the cold ISM



Cloud structure is clumpy and filamentary!

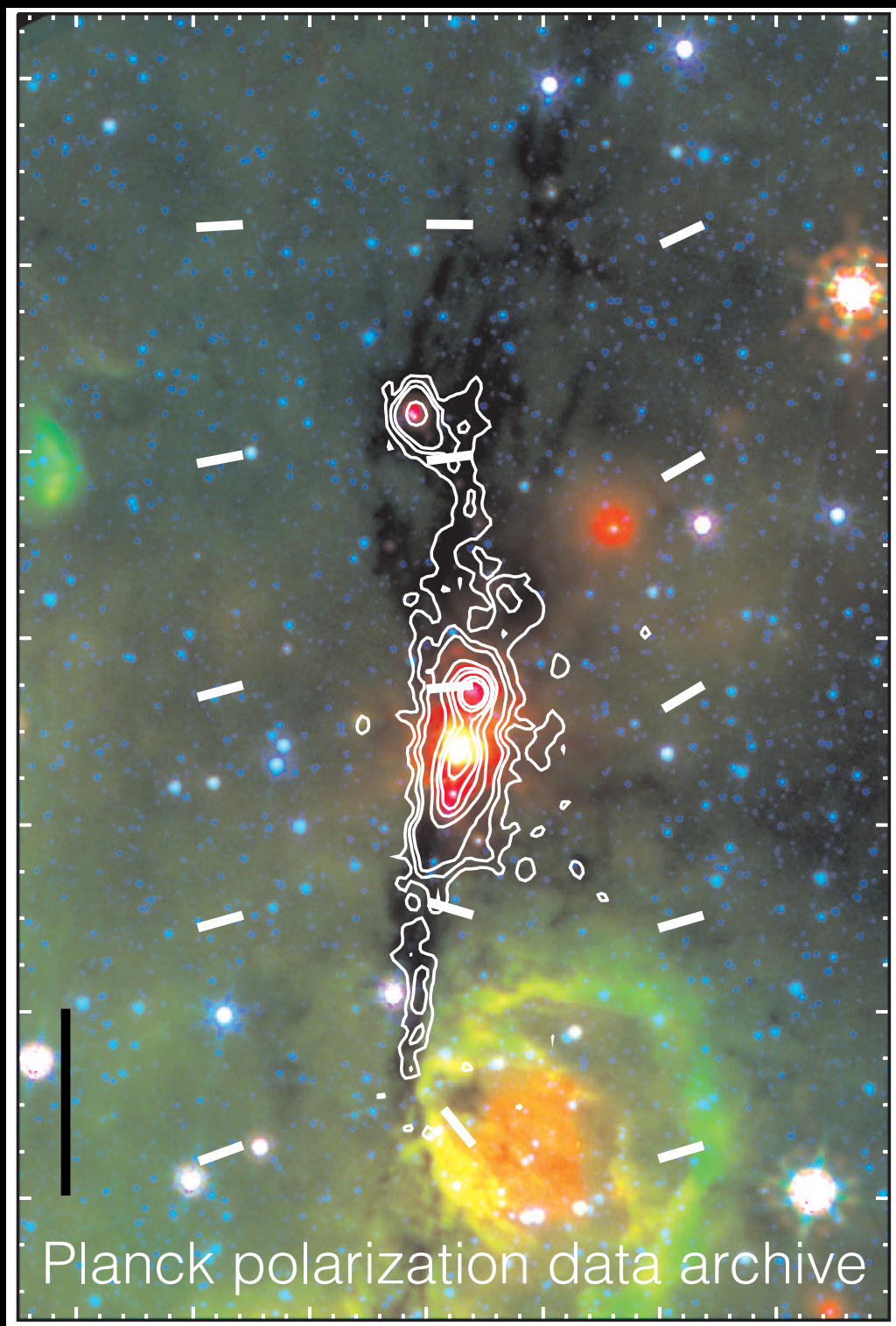
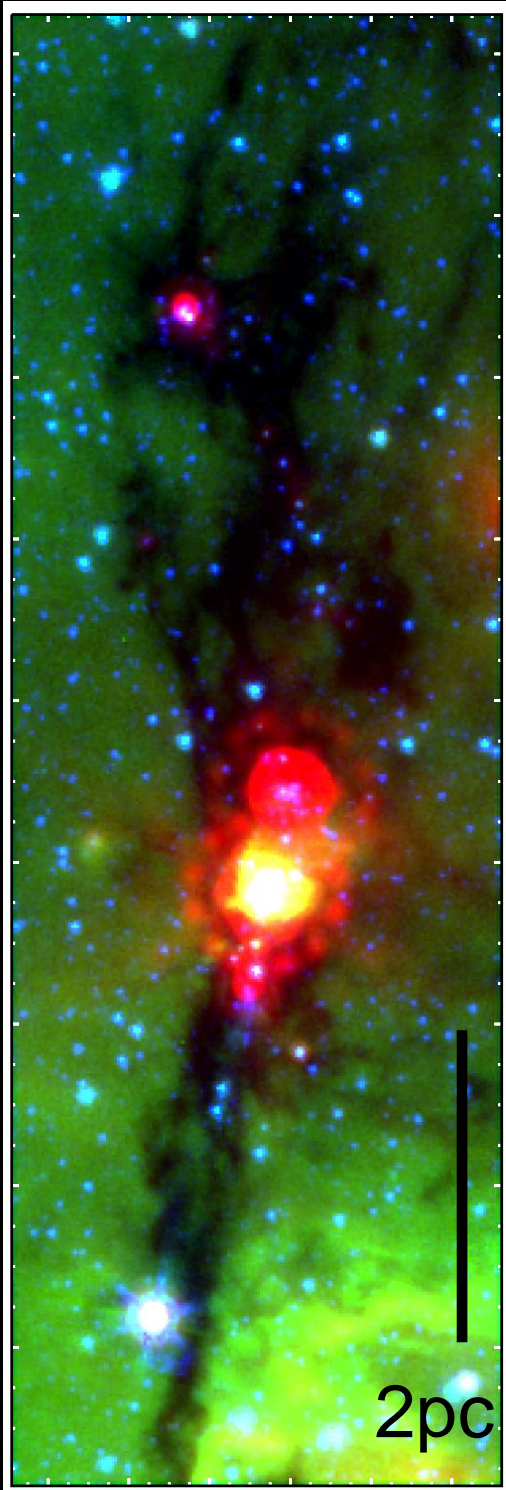
IRDC G34.43

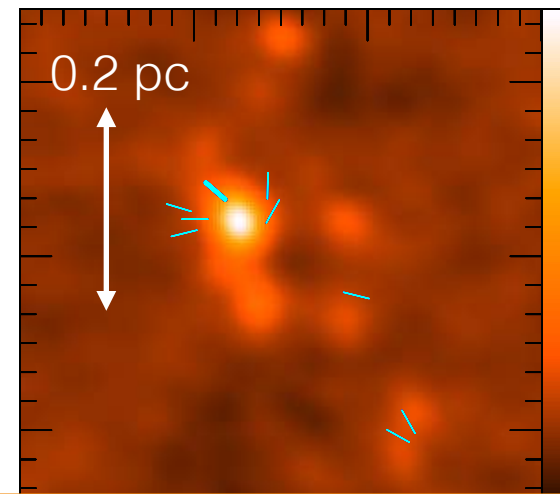
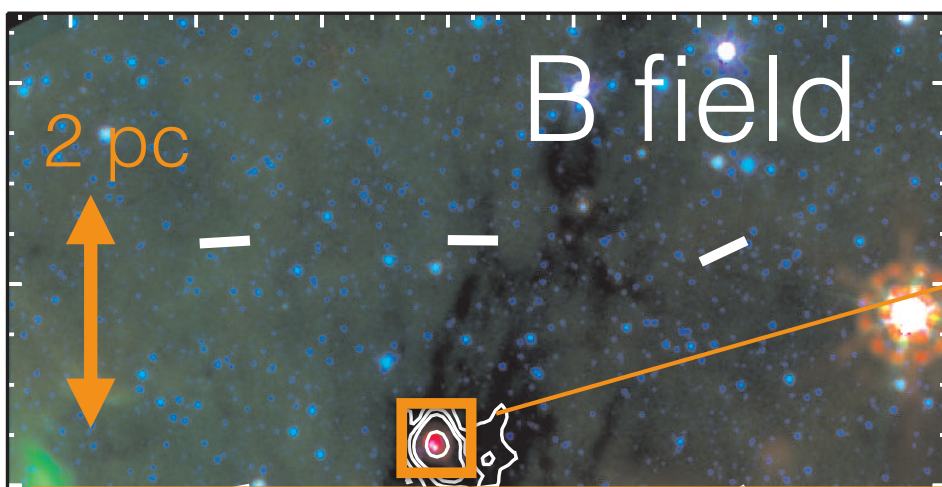
- Distance: 3.7 kpc
- Star formation rate is $\sim 7\%$ (Shepherd+2007)
- Distributed population of low mass protostars within the filament. Highest mass protostars form in the most bound portion of the filament. (Foster+2014)



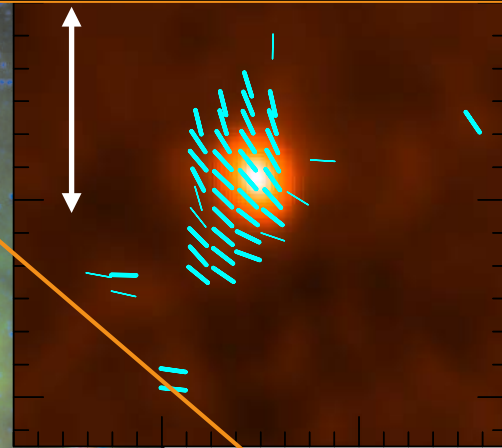
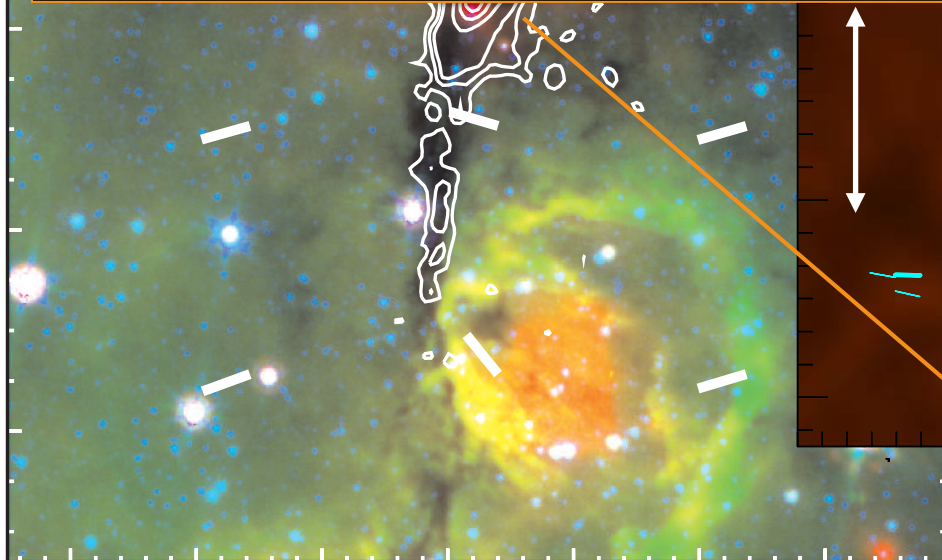
Spitzer images

Rathborne+2006

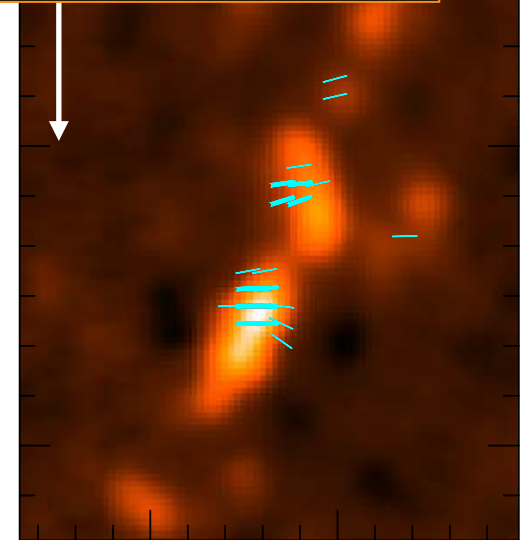




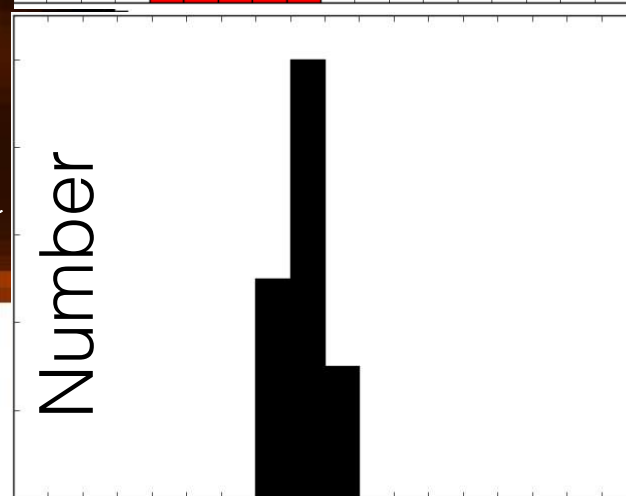
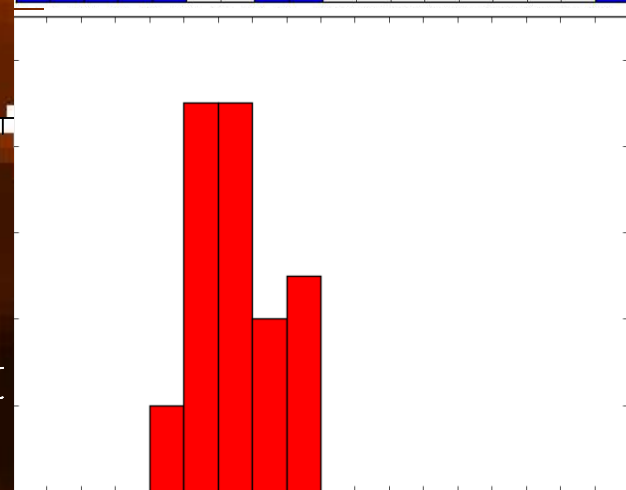
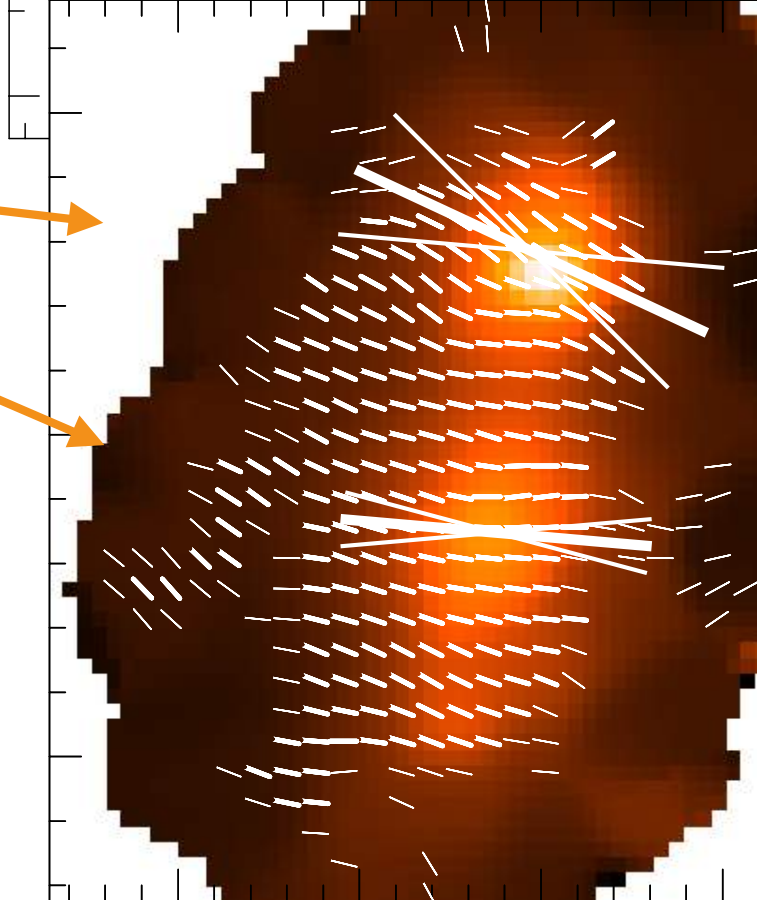
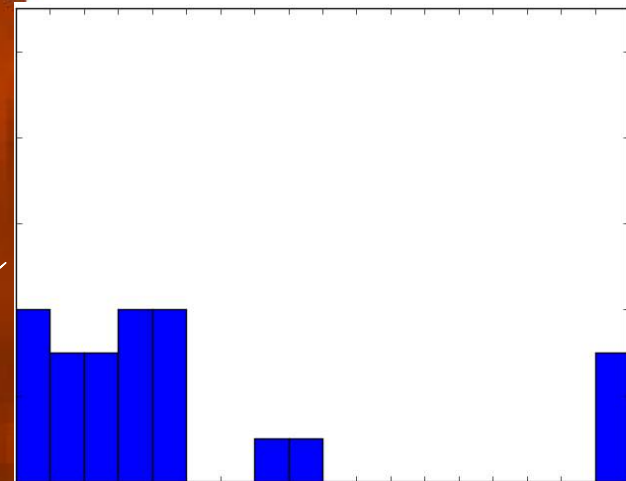
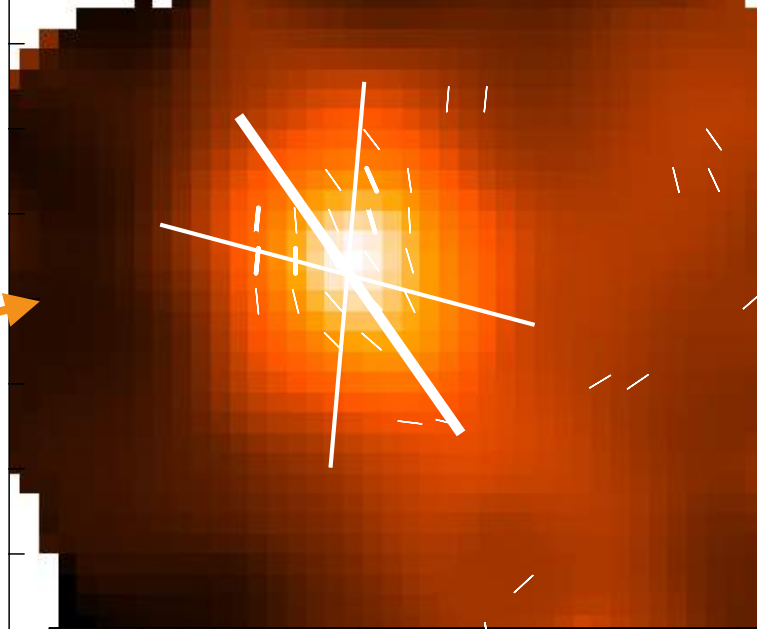
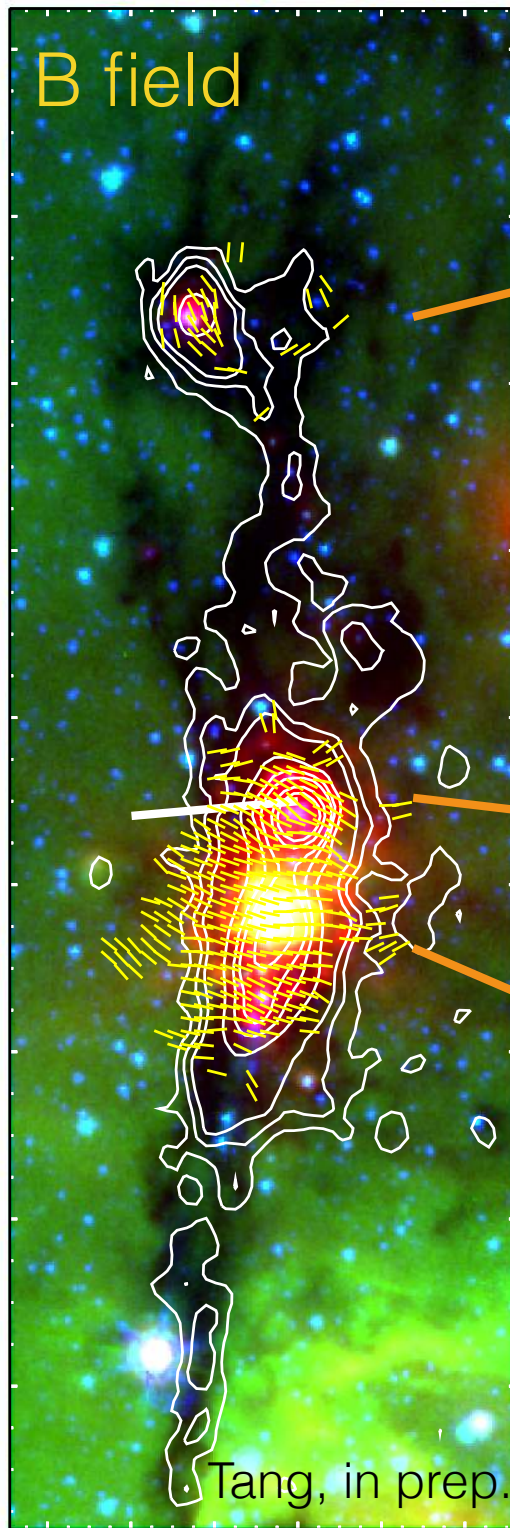
PLANCK resolution: $\sim 2'$ (2pc)
SMA/CARMA resolution: $\sim 2''$ (0.03 pc)
the B field at intermediate scale is missing!
SHARP on CSO at $350 \mu\text{m}$, $12''$ (0.25 pc)



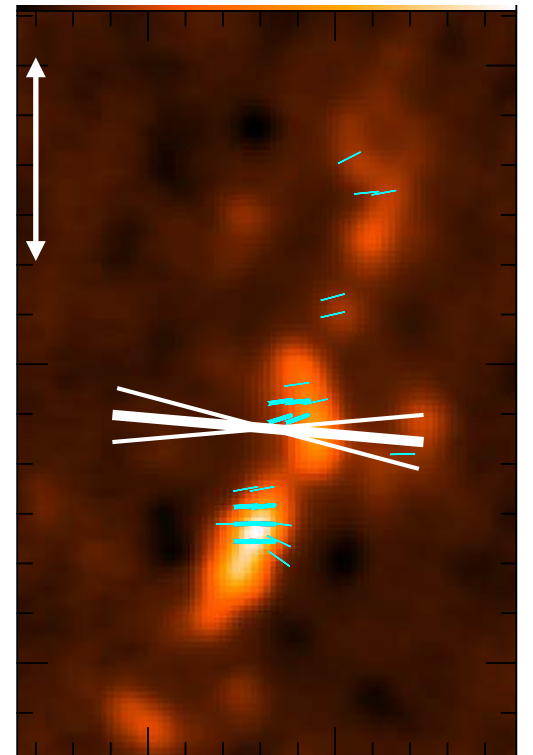
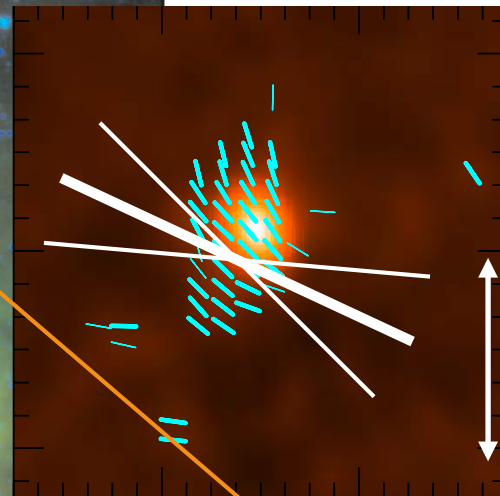
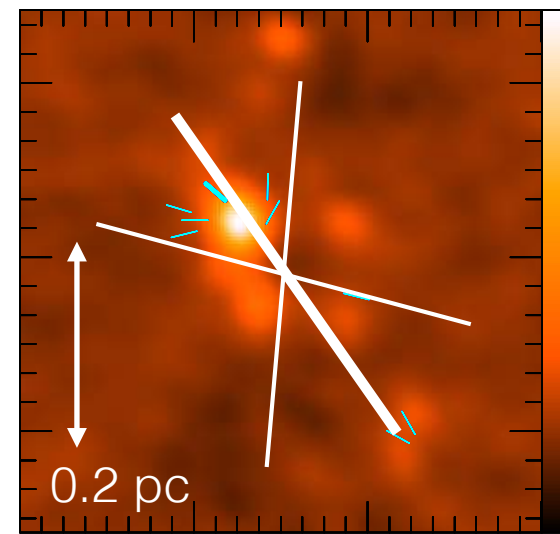
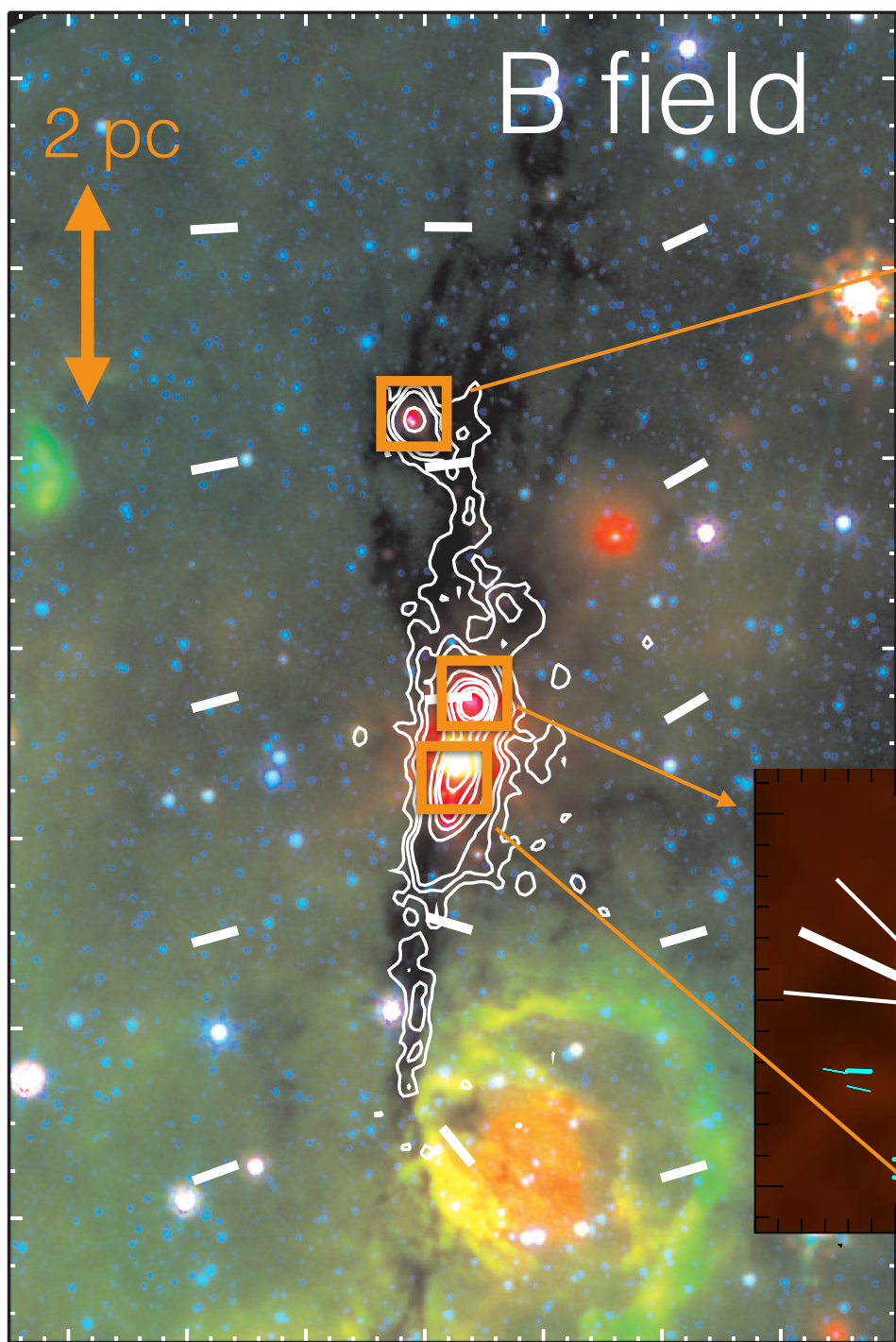
Hull+2014



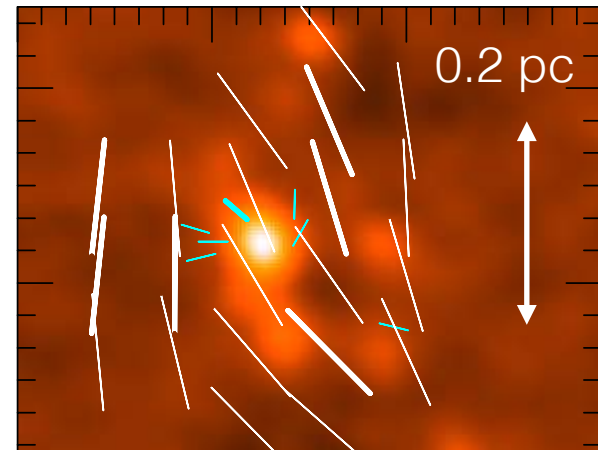
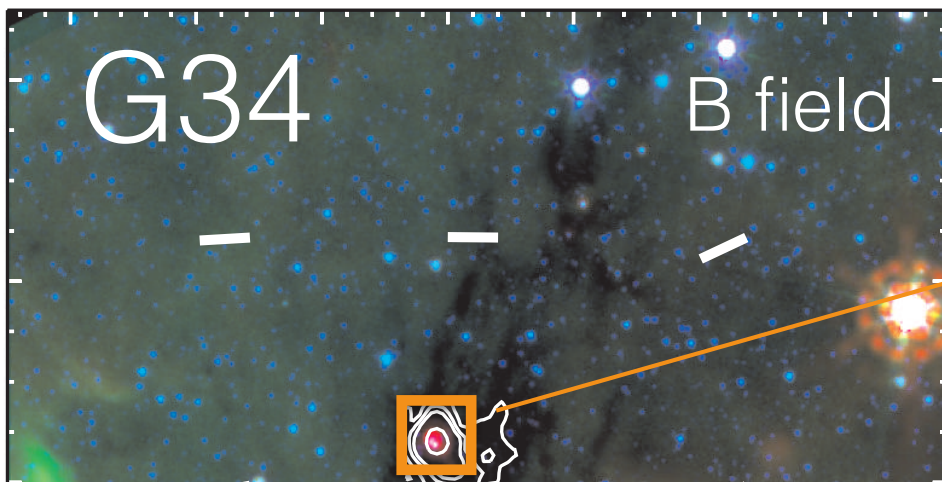
Zhang+2014



Position Angle

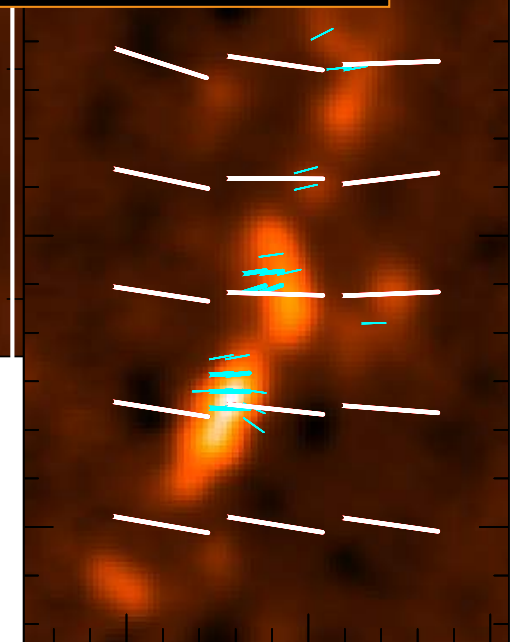
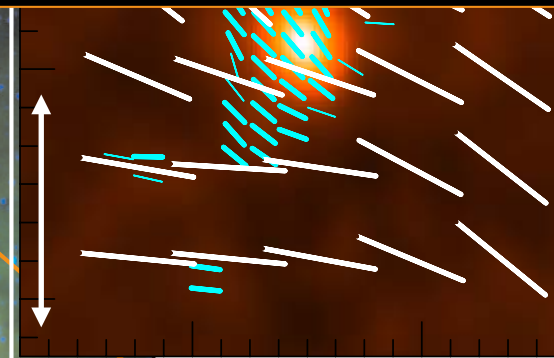
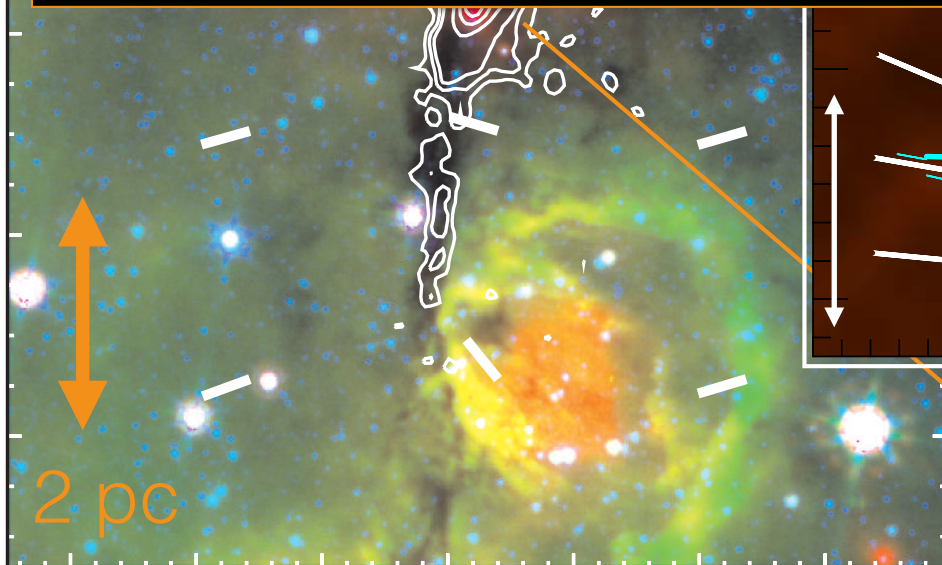


Tang, in prep.

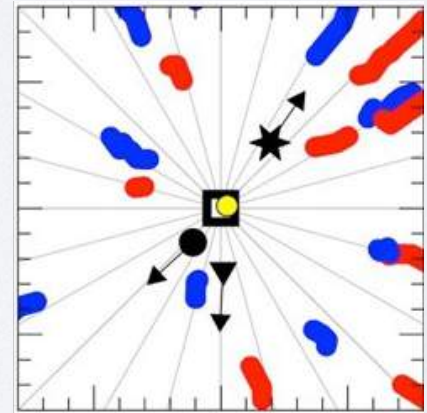
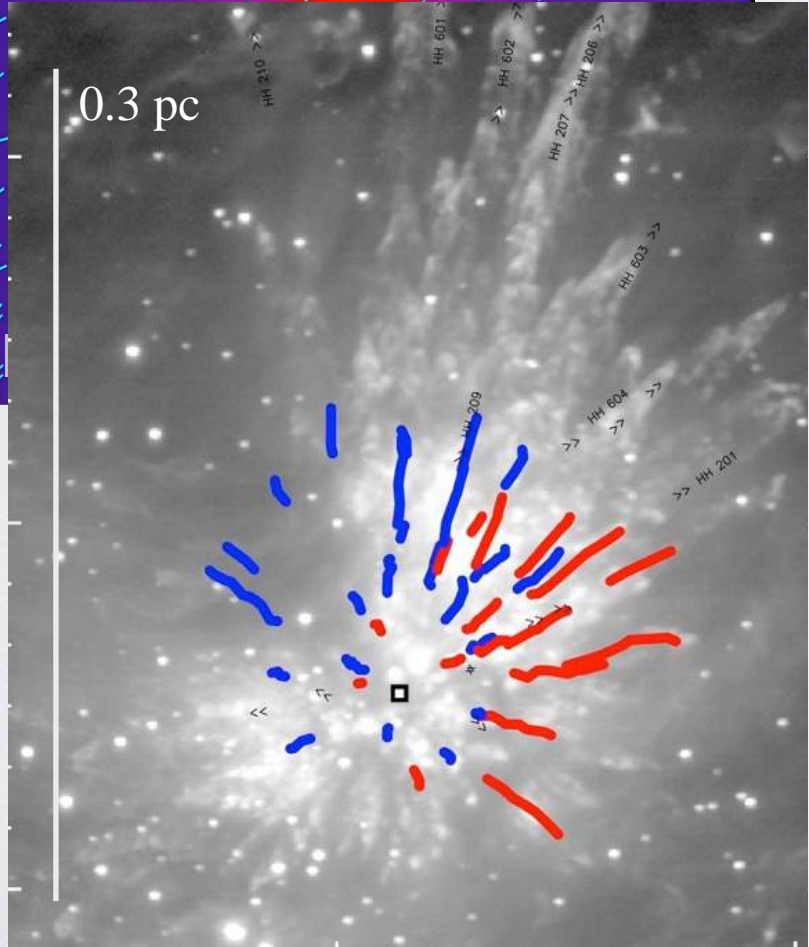
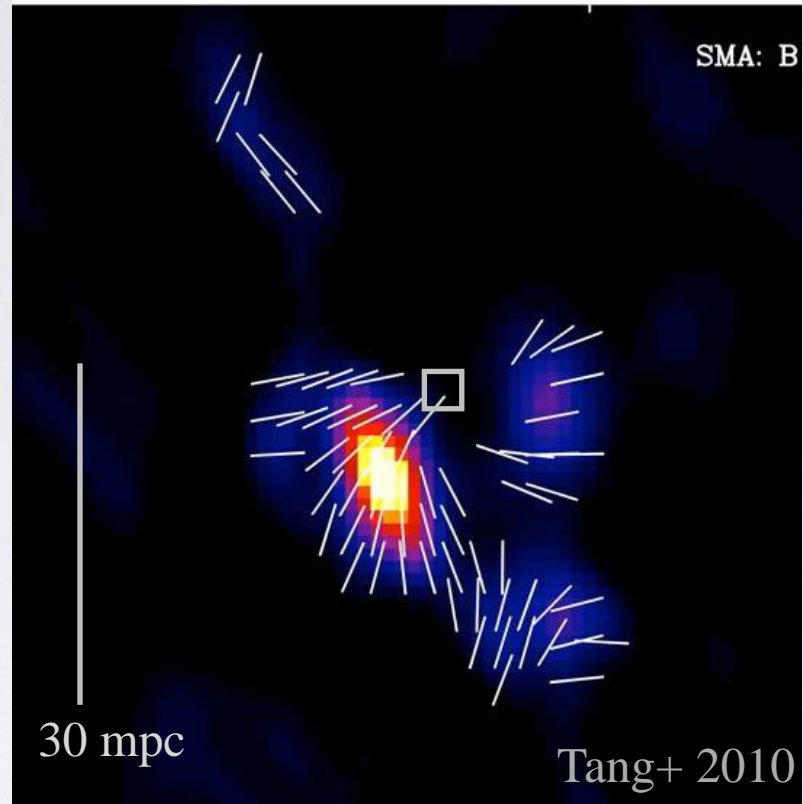
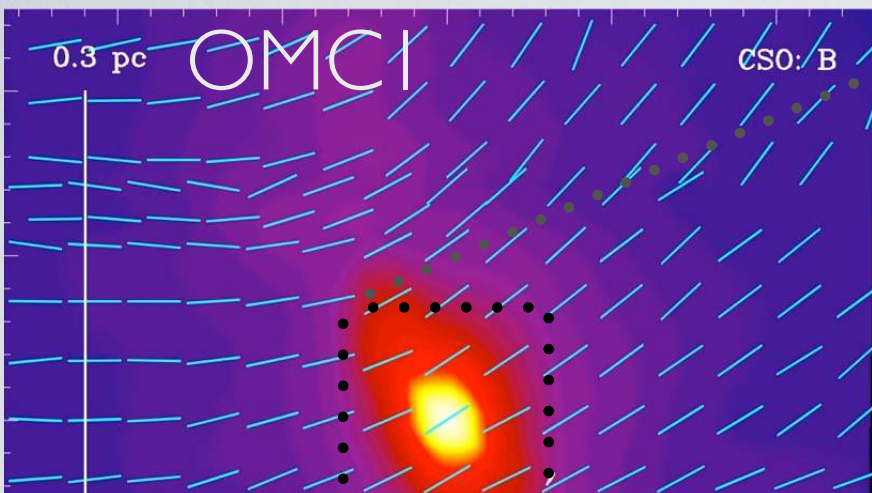


the B field orientations remain the same from 10 pc scale down to 0.1 pc scale in G34.43

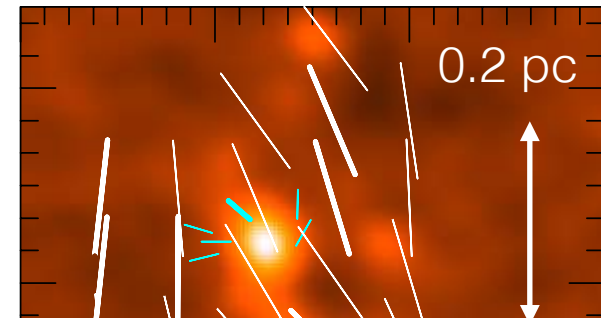
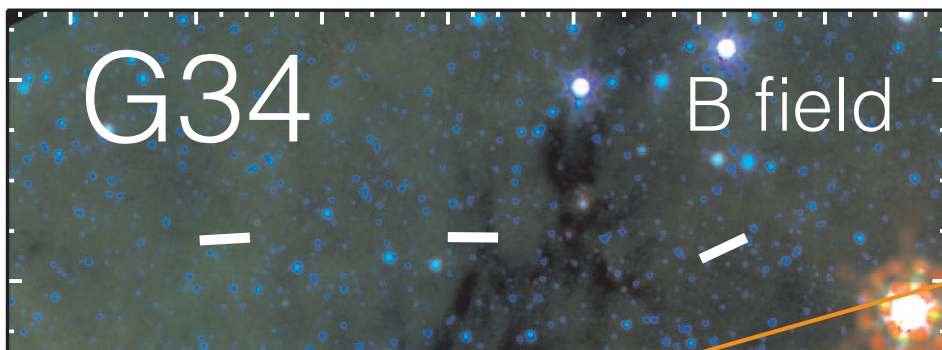
Is this a special case?



Tang, in prep.



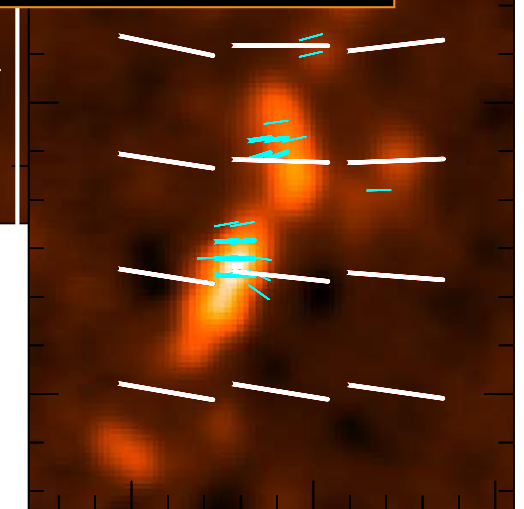
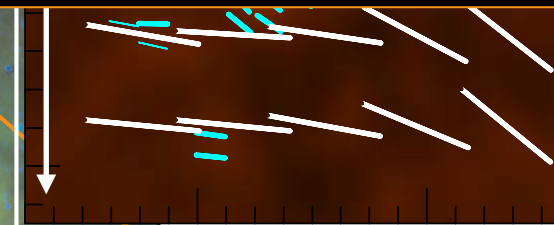
Color lines: CO outflow Zapata+2009
Background: H₂ jet



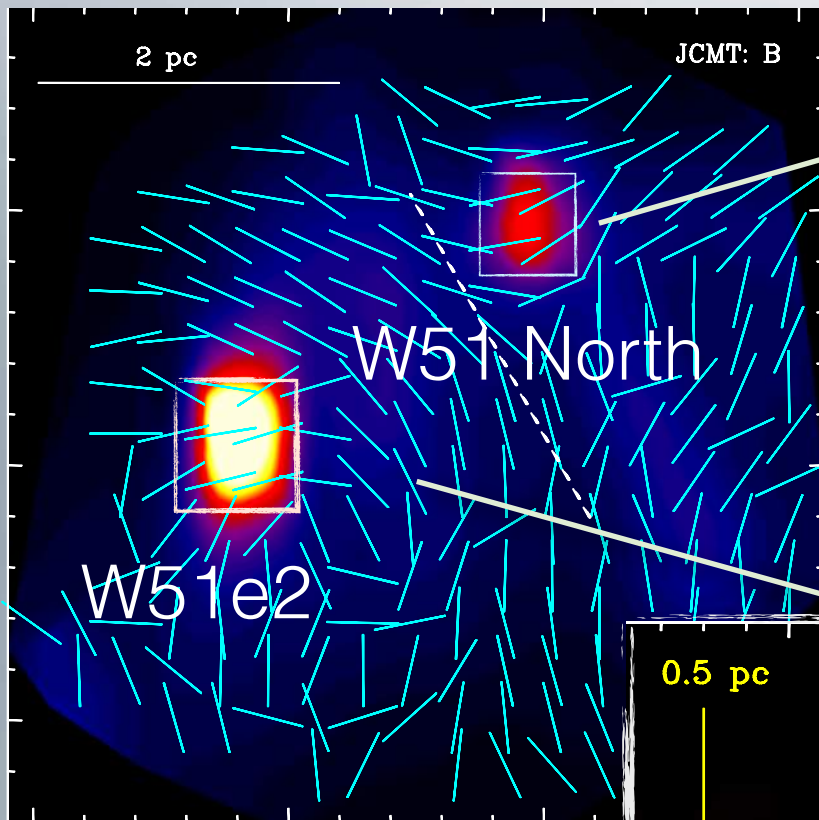
the B field orientations remain the same from 10 pc scale down to 0.1 pc scale in G34.43

Is this a special case?

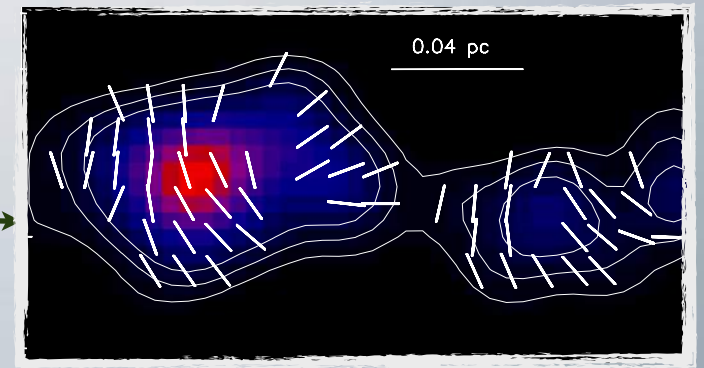
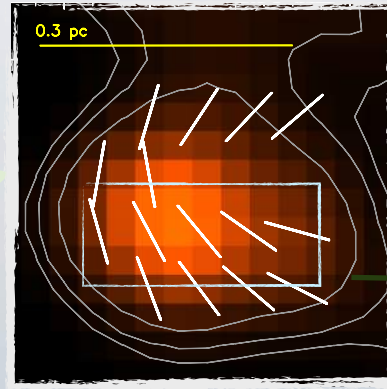
In the case of OMC1 and W51e2/W51 North, the B field orientations change dramatically at various scales.



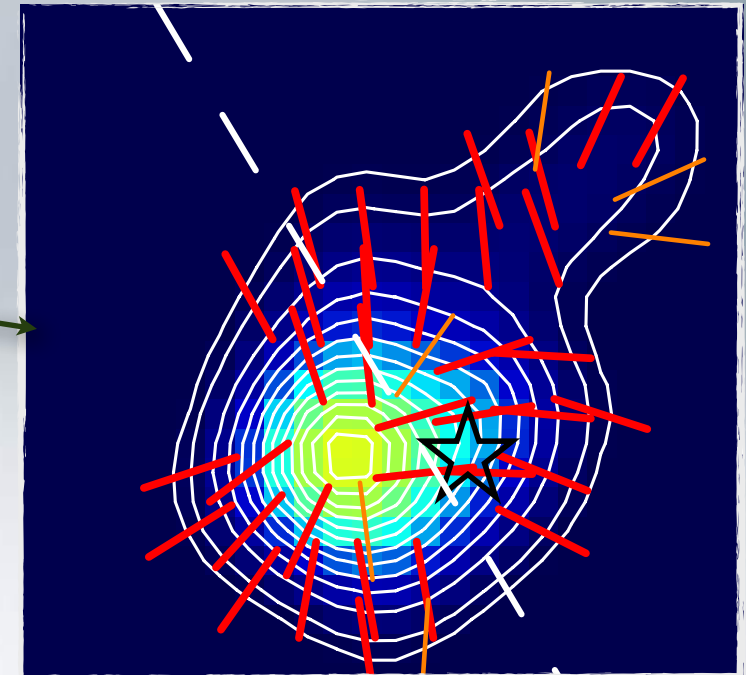
Tang, in prep.



Chrysostomou+2001

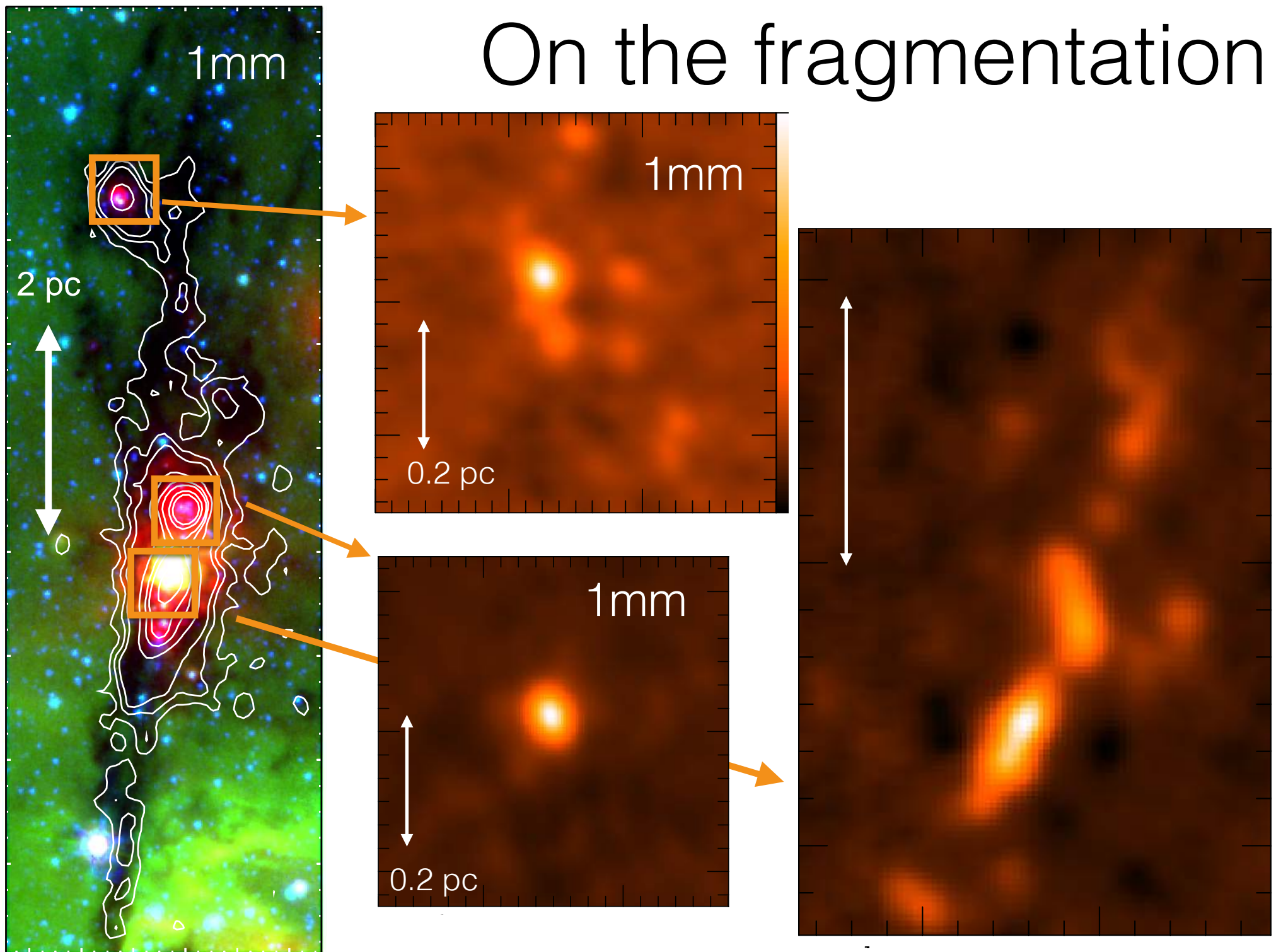


Tang+2013

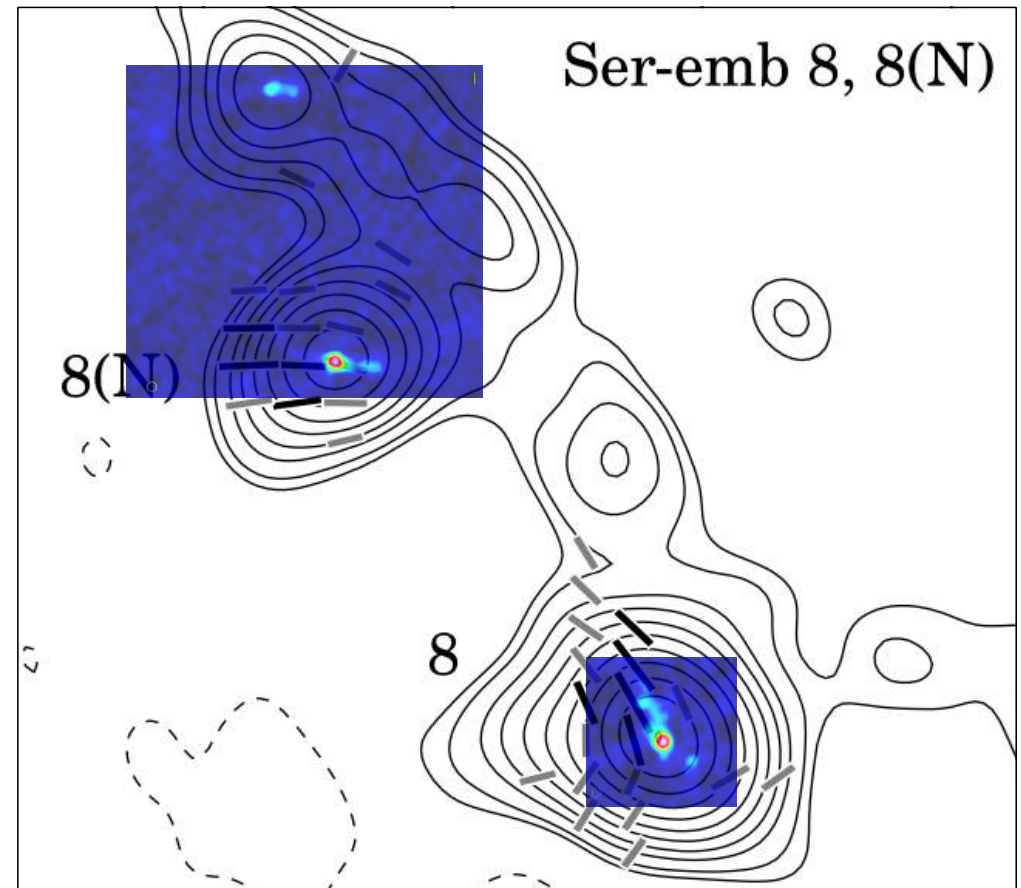
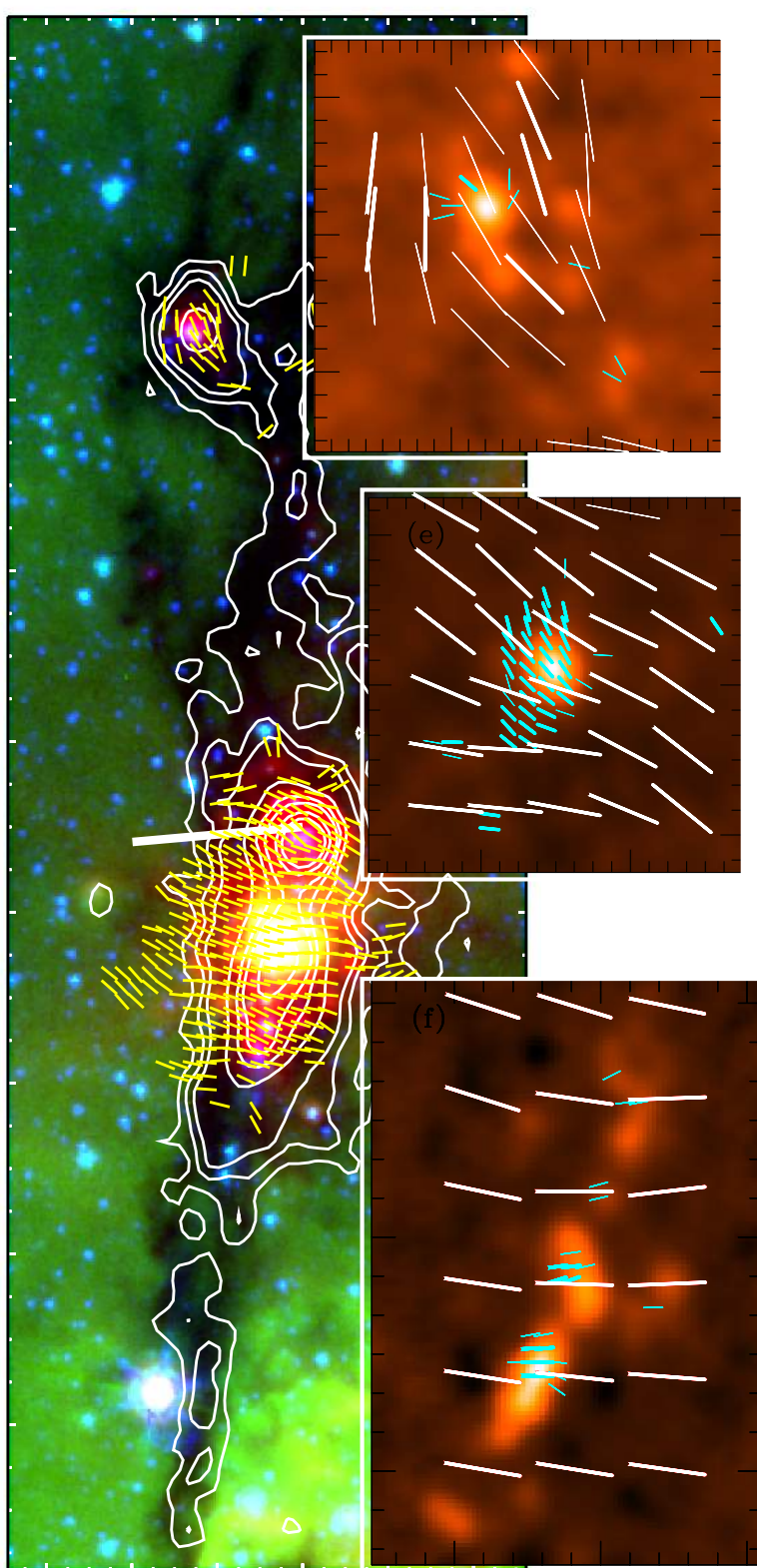


Tang+2009

On the fragmentation

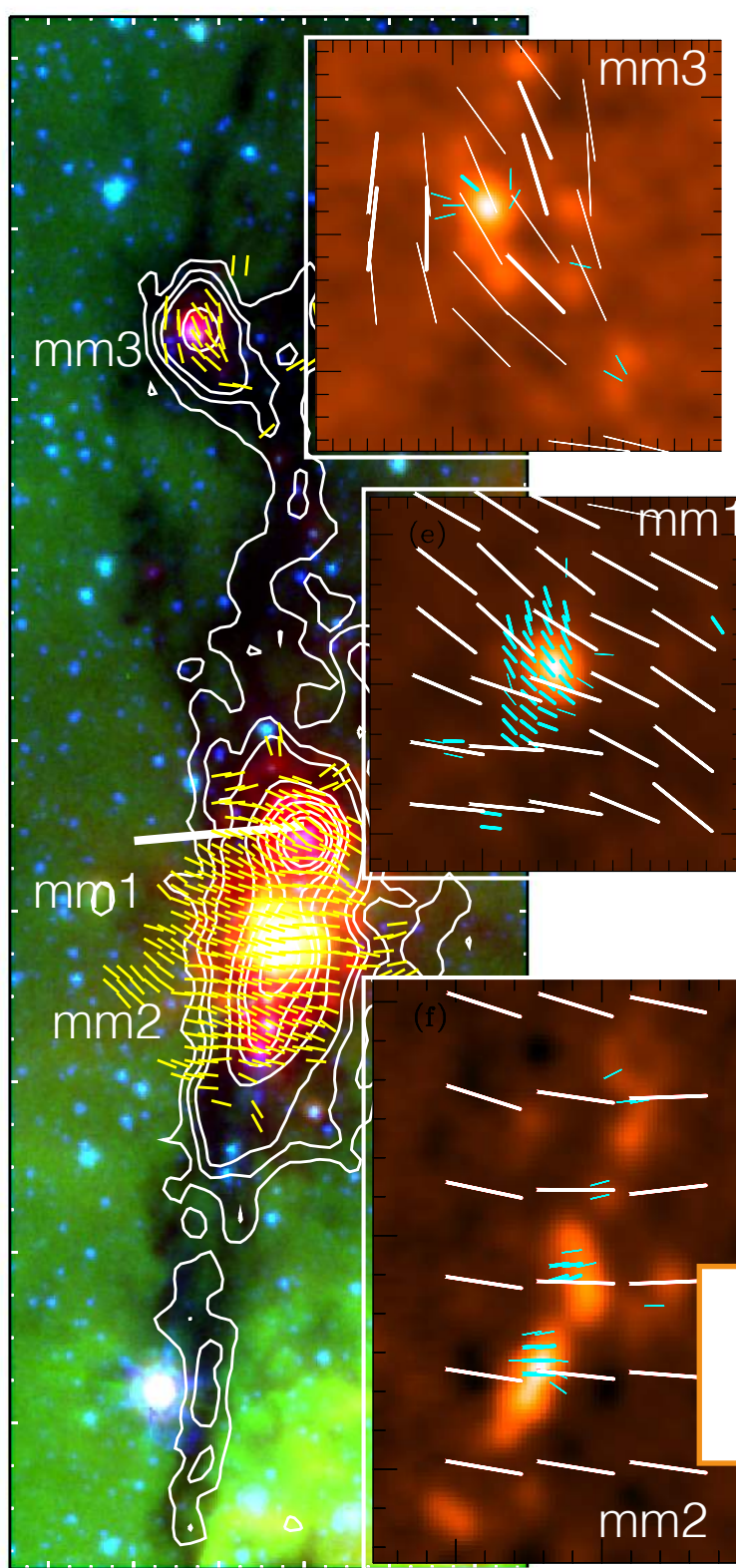


Comparison with Serpens

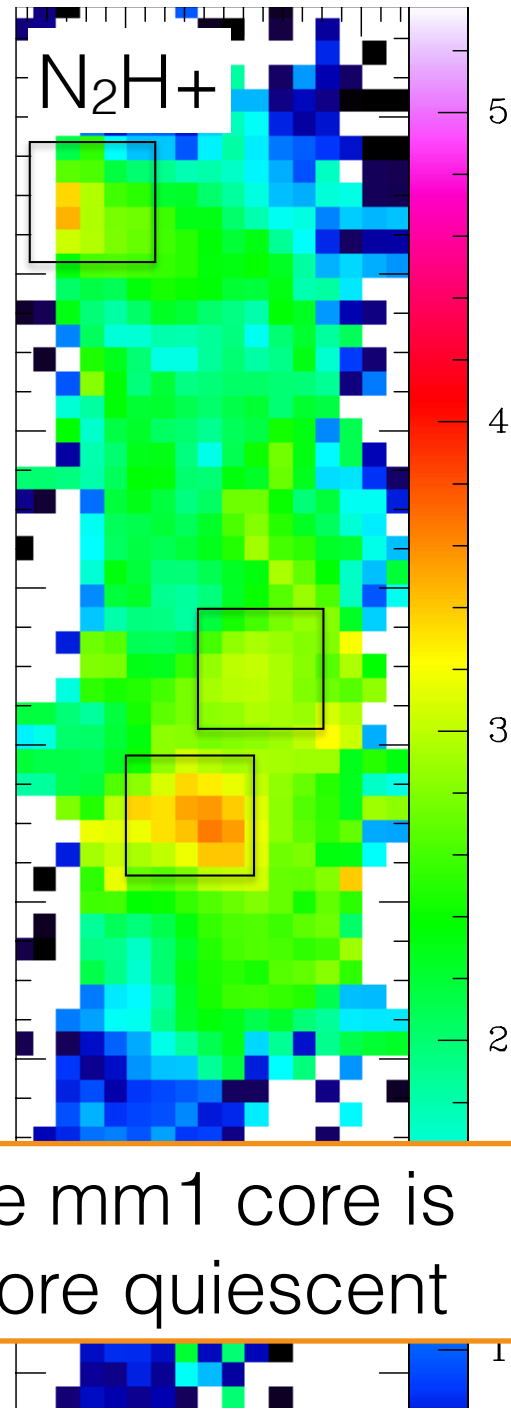


Chat Hull's talk

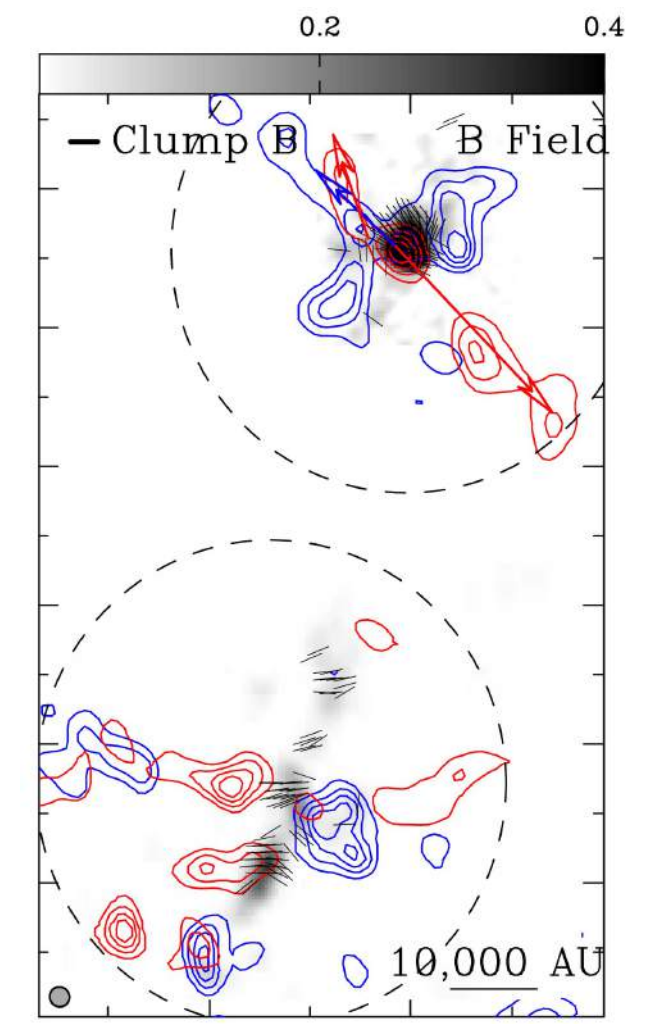
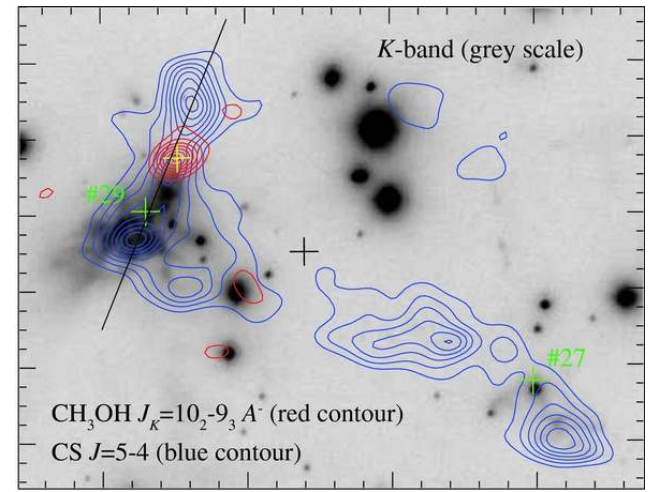
what governs the fragmentation process?
Can it be turbulence?



velocity dispersion



the mm1 core is more quiescent



Summary

- the B field sampled with SHARP on CSO is crucial, as it provides the information at intermediate scale between PLANCK/BLASTPOL and ALMA/SMA/CARMA
- B field orientations remain the same from 10 pc scale down to 0.1 pc scale in G34.43.
 - In the case of OMC1 and W51e2/W51 North, the B field orientations change dramatically at smaller scales, most likely due to stellar feedback or infall of gas toward the protostar.
- Fragmentation within the dense cores are dramatically different, ranging from remains single to cluster?
 - What governs the fragmentation process?