## lunch meeting ~ 1hr. 12:05 - 1:00 PM Presentation

# Possible Existence of Parallel Oriented Molecular Cloud in Gould Belt in Numerical Aspect

<small>Tsang Man Hi
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- 1. Why SFE so low? candidates are b-field & turbulent.
- 2. Disk formation & IMF

### Background

- What is ISM. & Molecular cloud (big picture).
- Base to build the research.
- Elongated properties of MC. (Examples, from PLANC | QL) (-> idea to study the long-axis orientation.)
- Turbulent & Magnetic field (Examples, shows some figures).
- linewidth observed is much wider then thermal emission (~10K), preventing from cloud from free-falling.
- Gas pressure is some how isotropic, but not for the magnetic field pressure.
- B-field (ordered) & elongated -> something to do to the SFE. (Li 2017)

#### Background

- Orientation of molecular clouds.
- Probing the Magnetic field
  - Zeeman measurement (LOS field strength)
  - 2. Polarmetary (Orientations).
- Defination of Cloud-field alignment

#### Background

- Li 2013 Discovery of bimodal cloud-field alignemnt
- Seifried 2015 MHD study of Cloud orientation
- Law 2020 MCF slope study of mass accumulation
- Li 2017 study of star-formation effeciency.

### Project details.

- 1. Simulation setup
- 2. Projections
- 3. MCF & SFE.
- 4. Statistical test
- 5. Result.

#### Discussion

Why Solar can't see the Li17 trends

Density threshold

(Go through this paper)

- $\circ$  Solar use the density threshold above the critical density AV=8, a range that cloud mass is linearly correlated with the star-formation rate.
- $\circ~$  Li 2017 analyzed using cloud mass above AV=2, not only focusing on the high density region.

Collisional Coefficient. (WG Appendix) Drag force term.

WG-tests with realistic collisional coefficient (inconsistence result

Same result if repeating Balsara's result.

Ask's ZY opinion.

Draine 1986.

A numerical scheme and benchmark tests for non-isothermal two-fluid ambipolar diffusion

David A. Tilley

, Dinshaw S. Balsara, Chad Meyer

New Astronomy 17 (2012) 368-376