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Magnetic field–gas density relation in Dense Cores with Different Collapsing Types

When dense cores or molecular clouds collapse, both the gas density (ρ) and magnetic field strength (B) increase (Crutcher+2010). Theoretical models predict that the power-law index of the B–ρ relation depends on the magnetic field orientation and the geometry of the contracting clouds (Tritsis+2015). In this project, we plan to test the core collapsing process predicted by the Textbook model (Li 2017). We first identify cores exhibiting different collapsing types using the James Clerk Maxwell Telescope (JCMT) 850 μm continuum maps. Then, we will estimate the magnetic field strength at each position within the dense cores and molecular clouds by applying the Davis-Chandrasekhar-Fermi (DCF) method and the polarization-intensity gradient method (Koch+2012). This approach allows us to compare the B–ρ relations in different types of collapse. With ALMA data, we can further check the magnetic field structure in the envelope scale.

Section

Star Formation

Primary authors: KAO, Jo-Shui (NTHU/ASIAA); LAI, Shih-Ping (Institute of Astronomy, National Tsing Hua University); Dr YEN, Hsi-Wei (ASIAA)

Presenter: KAO, Jo-Shui (NTHU/ASIAA)

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