

Contribution ID: 115

Type: **Oral**

Linking Multi-Scale Energetics with Fragmentation in Massive Star-Forming Clump SDC40.283

Friday, May 16, 2025 2:30 PM (15 minutes)

The change in the relative importance of gravity, turbulence, and magnetic field affects the fragmentation of massive star-forming dark clouds. Using dust continuum and polarization data, as well as molecular transition lines from the JCMT, IRAM-30m and the SMA, we investigated the energetics of various star forming regions to understand the correlation between the three factors and fragmentation. In this work, we focused on SDC40.283-0.216, an infrared dark cloud that has one dense clump and shows no signs of fragmentation. SDC40 appears to be dominated by gravity at pc scale (~ 7 pc) and at sub-pc (~ 0.2 pc) scale. The change in energy ratio from clump scale (~ 0.7 pc) to core scale (~ 0.2 pc) is similar to the trend seen in MM1 in G34.43+00.24, another clump showing no fragmentation while being gravity-dominated. However, results from SDC18.624-0.070 suggest that a strong magnetic field can suppress fragmentation. While the clumps all show no fragmentation, the underlying mechanisms may be different.

Section

Star Formation

Primary author: TSENG, Ingrid (NTU / ASIAA)

Co-authors: TANG, Ya-Wen (ASIAA); CLARKE, Seamus (NCKU)

Presenter: TSENG, Ingrid (NTU / ASIAA)

Session Classification: Plenary session