

Poster: Filamentary Accretion Flows in the IRDC M17 SWex

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Although filamentary structures are ubiquitous in molecular clouds, basic observational constraints are needed to clarify the role of filaments in the mass assembly process. Using ALMA Band 3, we have performed full-synthesis imaging of the N₂H⁺ (1-0) emission in the remarkable IRDC complexes, M17 SWex, where a delayed onset of massive star formation was reported in the two hubs at the convergence of multiple filaments of parsec length. We derive gas kinematics by fitting the hyperfine components of N₂H⁺ spectra and clearly detect velocity gradients along filaments associated with hubs. The mass accretion rates are in the range of 10^{-5} to 10^{-4} M_⊙/yr. The line widths are generally smaller than those of ammonia, suggesting a transonic nature of dense gas in the filaments. Assuming a Plummer-like density structure, we measure the widths of the filaments roughly 0.06 pc, smaller than but comparable to what reported in Herschel observations. Multiple velocity-coherent substructures are seen in both hubs, likely not yet reaching virial equilibrium.

Filaments