Filamentary Accretion Flows in the IRDC M17 SWex

Huei-Ru Vivien Chen[1,2]; Qizhou Zhang[3]; Fumitaka Nakamura[4]; Gemma Busquet[5]; Patricio Sanhueza[4]; Satoshi Ohashi[4,6]; Aina Palau[7]

[1]Institute of Astronomy & Department of Physics, National Tsing Hua University, Hsinchu, Taiwan; [2] Academia Sinica, Institute of Astronomy and Astrophysics, Taipei, Taiwan; [3]Harvard-Smithsonian Center for Astrophysics, Cambridge, USA; [4]National Astronomical Observatory of Japan, Tokyo, Japan; [5]Institut de Cie?ncies de l'Espai (IEEC-CSIC), Barcelona, Spain; [6]Department of Astronomy, The University of Tokyo, Japan; [7]Instituto de Radioastronomi?a y Astrofi?sica, Universidad Nacional Auto?noma de Me?xico, Me?xico

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 observed the N_2H^+ (1-0) and HNC (1-0) emission in the filamentary accretion flows 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 derived gas kinematics with the N_2H^+ emission and found the line widths are smaller than those of ammonia, suggesting a transonic nature of dense gas in the filaments. Slow infall motions towards the hubs are detected along the filaments. Multiple velocity-coherent substructures are present in both hubs, likely not yet reaching virial equilibrium.