
Formation of the Musca filament: evidence of a large scale HI cloud collision

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Abstract

To better understand the formation of star forming filaments, we analysed CO observations with the APEX telescope towards the Musca filament. In the APEX maps we find evidence for continuous mass accretion onto the filament. To understand the origin of these local dynamics, we studied the kinematics of the Chamaeleon-Musca complex with NANTEN2 CO and GASS HI data. Our analysis supports the view that star formation in Chamaeleon-Musca originates from a low-velocity (5-10 km/s), 50 pc scale HI cloud-cloud collision. In this collision, bending of the magnetic field, as described in Inoue et al. 2018, would be responsible for the observed local accretion in Musca. To further understand the physical processes governing on-going star formation, one must study in detail molecular cloud formation. This must be aided by advanced statistical methods due to data complexity and volume.

Keywords: Cloud formation, ISM: kinematics and dynamics, ISM: structure

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