Abstract Submitted
for the CUWIP21 Meeting of
The American Physical Society

Modeling N_2H^+ Emission around DM Tau AMINA DIOP, Williams College — Turbulence is one of the key processes influencing planet formation, hence we are investigating the mechanism driving it by studying its vertical structure. We have been working with the disk around DM Tau since it is so far the only system where significant non-zero turbulence has been robustly detected in its upper layers using molecular line emission. To estimate turbulence near the midplane in the outer disk, we are using N_2H^+(3-2) and DCO^+(4-3) emissions alongside a ray-tracing radiative transfer code with a parametric model of the disk structure and Markov Chain Monte Carlo methods. Our current models for N_2H^+ display the same features as the actual emission but they fail to capture the outer emission. This discrepancy could potentially be accounted for by revisiting the CO freeze-out temperature. Our results also reveal that the CO snowline is closer to the star than previously determined. Finally, the DCO^+(4-3) emission is depleted between 104 and 156 au; which could be linked to a combination of CO freeze-out, non-thermal desorption, and radial migration of dust grains.

Amina Diop
Williams College

Date submitted: 04 Jan 2021 Electronic form version 1.4