Abstract Submitted
for the CUWIP22 Meeting of
The American Physical Society

Magnetic Fields in Diffuse Interstellar Gas: Comparing Starlight Polarization, Polarized Dust Emission and Neutral Hydrogen Orientation SALLY JIANG, Yale University, SUSAN CLARK, Stanford University, GINA PANOPOULOU, California Institute of Technology — The Galactic magnetic field affects many processes in the interstellar medium (ISM), such as star formation and the flow of interstellar gas. The plane-of-sky magnetic field orientation is probed by the alignment of dust in the ISM, which absorbs and polarizes background starlight, and also emits partially polarized thermal radiation. The polarization fraction of dust can also be used to probe the degree of disorder in the magnetic field, both along the line of sight and within the telescope beam. Filaments of neutral hydrogen (HI) are found to be, on average, parallel to the plane-of-sky magnetic field in diffuse regions (Clark et al 2014). We explore starlight polarization and HI orientation as a function of the dust polarization fraction at high Galactic latitudes. We find that on average, regions of high dust polarization fraction have a higher degree of alignment between HI orientation and starlight polarization angles compared to low dust polarization regions. We interpret regions of lower dust polarization as having less coherent plane-of-sky magnetic field structure, likely due to the 3D magnetic field geometry. We investigate whether there is evidence for a physical loss of alignment between HI orientation and the magnetic field in select regions.

Sally Jiang
Yale University

Date submitted: 10 Jan 2022 Electronic form version 1.4