中華民國天文學會
The Astronomical Society of the Republic of China (Taiwan)

Contribution ID: **158** Type: **Poster**

# Probing the Magnetic Field Structure of the Protoplanetary Disk in HD 163296

The magnetic field structure within protoplanetary disks is thought to influence key processes in star and planet formation.
In this study, we aim to infer the magnetic field structure within the protoplanetary disk surrounding HD 163296, a young Class II Herbig Ae star, by analyzing archival ALMA polarization data at a wavelength of 870 μm.
Traditionally, magnetic field morphology is inferred from polarization produced by magnetically aligned dust grains. However, recent studies suggest that dust grains in such disks may have grown to sizes capable of producing significant polarization through self-scattering, complicating the interpretation.
To extract the magnetic field structure, we assume that the observed polarization arises primarily from two mechanisms: dust self-scattering and thermal emission from magnetically aligned grains. We construct a physical model of the disk using density and temperature profiles derived from previous observations. With the radiative transfer code RADMC-3D, we estimate the polarization expected from dust self-scattering, and then attribute the remaining polarization to magnetically aligned grains to infer the magnetic field structure within the disk.
Finally, we assess the consistency of our results with theoretical predictions

## Section

Star Formation

**Primary author:** LIN, Yu-Xuan (National Yang Ming Chiao Tung University)

**Presenter:** LIN, Yu-Xuan (National Yang Ming Chiao Tung University)

**Session Classification:** Poster-SF