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Seeking for magnetic fields through ALMA polarimetric studies of rotating jet/disk systems

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We have recently obtained ALMA Band 7 polarimetric data for the young systems DG Tau and CW Tau, for which the rotation properties of jet and disk have been investigated in previous high angular resolution studies.

The motivation was to test the models of magneto-centrifugal launch of jets via the determination of the magnetic configuration at the disk surface. Non-spherical dust grains tend to align with their short axes parallel to the magnetic field, and in this case the dust radiation is polarized, with polarization vectors perpendicular to the direction of the magnetic field lines. We thus planned to compare the rotation properties in these systems with the observed magnetic field geometry. We present here the first results of the project, illustrating the different interpretations.

The analysis of these data reveals that dust self-scattering concurs strongly to shape the polarization patterns. It is shown that even if no information on the magnetic field can be derived in this case, the polarization data are a powerful tool for the diagnostics of the dust properties in disks.

Contribution

Talk

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