

Photometric & Polarimetric observations of T-Tauri star

Topic : (Planetary Sciences)

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Accretion process in the proto-planetary dust disk of newly formed star like “T-Tauri stars” plays crucial role in the formation of stellar system. The cause of polarization mechanism in the proto-planetary disc in T-Tauri stars is still not well understood! T-Tauri stars very often show anti-correlation of polarization of light with brightness, the so-called “UXOR” behavior. Polarization angle changes with respect to time and it depends on the geometry of the disc. To understand this phenomena and structure of the disk, we have taken Photometric & Polarimetric observations of “Su Aur” from IGO(IUCAA Giravali Observatory) using IFOSC(IUCAA Faint Object spectrograph & Camera) on 15 Feb 2007. Results of this research work are confirming “UXOR” behavior in our target star. Our result shows, polarization of light in our target star is around 0.3%, which changes with respect to time, and change in polarization angle is around 20°. Along with our target one polarized and two unpolarized standard stars were observed for calibration. We can conclude from our dataset that geometry of “Su Aur” is not equator-on but inclined with the line of sight.

For our future observations, deviations from “Serkowski law” in the wavelength dependence can be used to detect the presence of polarization contribution due to scattering from sources other than aligned dust in the circumstellar disk. Extinction measurement combined with polarization will give clues about the nature of the scattering dust. Short and long time baseline observations will allow verification of conformity or otherwise to OXOR behavior changes with epoch for the same object.

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