What do weak magnetic fields mean for magnetospheric accretion in Herbig AeBe star+disk systems?

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Abstract

In the presently favored picture of star formation, mass is transferred from disk to star via magnetospheric accretion (MA) and out of the system via magnetically driven outflows. This magnetically mediated mass flux is a fundamental process upon which the evolution of the star, disk, and forming planetary system depends. Our current understanding of these processes is heavily rooted in young solar analogs, T Tauri Stars (TTS). We have come to understand recently, however, that the higher mass pre-main sequence (PMS) Herbig AeBe (HAeBe) stars have dramatically weaker dipolar fields than their lower mass counterparts. In this talk, I will discuss our current observational and theoretical efforts to characterize magnetospherically mediated mass transfer within HAeBe star+disk systems. We have gathered a rich spectroscopic and interferometric data set for several dozen HAeBe stars in order to measure accretion and mass loss rates, assess wind and magnetospheric accretion properties, and determine how spectral lines and interferometric visibilities are diagnostic of these processes. For some targets, we have observed spectral line variability and will discuss this in the context of episodic mass loss events and possible parallels with similar processes in lower mass PMS stars.

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