The recently discovered binary system TWA 30 consists of two of the nearest known examples of actively accreting, pre-MS star systems. Both components of TWA 30A have masses just above the brown dwarf regime and are orbited by circumstellar disks viewed nearly edge-on, with evidence for collimated stellar outflows. TWA 30A, a known X-ray source, exhibits large, variable optical/IR extinction that is evident due to variable disk absorption. We have obtained XMM Newton X-ray observations of TWA 30A and B. Here, we present preliminary results of analysis of XMM/EPIC spectroscopy of component A, which is well detected, as well as a sensitive upper limit on the emergent X-ray luminosity of component B. We explore whether X-ray emission from accretion shocks and/or jets is detectable in as low-mass an object as TWA 30A, and we compare the effects of X-ray and optical/IR extinction due to the nearly edge-on disk in this system. The latter results offers a novel means to constrain the gas/dust ratio in the TWA 30A disk, thereby providing constraints on the process of protoplanetary disk dissipation in the low-mass stellar regime.

To identify candidate nearby young, low-mass stars, both accreting and nonaccreting, we and others have been exploiting the following (e.g., Rodriguez et al. 2011 and refs. therein):

- Young (~100 Myr-old), solar- and lower-mass stars are hyperactive producers of high-energy (UV and X-ray) radiation; their spectral energy distributions peak in the near-IR, and their disks peak in the mid- to far-IR; they generally display strong Li absorption; they cluster in galactic (UVW) space, and B and TWA 30 both display near-infrared variability on timescales of days. TWA 30A varies parallel to the reddening vector from Cardelli et al. 1989 whereas TWA 30B follows the classical T Tauri Star locus from Meyer et al. 1997. The contrarvariant behavior between TWA 30 A and B suggests that the near-infrared (NIR) excesses of these two stars have different origins. The NIR excess from TWA 30A likely results from variable degrees of occultation of disk material whereas TWA 30B likely displays reprocessed light emitted by disk structure close to the disk inner edge and variably scattered towards us.

As illustrated in the figure (right-modified fromLooper et al. 2010b), TWA 30 A and B both display near-infrared variability on timescales of days. TWA 30A varies parallel to the reddening vector from Cardelli et al. 1989 whereas TWA 30B follows the classical T Tauri Star locus from Meyer et al. 1997. The contrarvariant behavior between TWA 30 A and B suggests that the near-infrared (NIR) excesses of these two stars have different origins. The NIR excess from TWA 30A likely results from variable degrees of occultation of disk material whereas TWA 30B likely displays reprocessed light emitted by disk structure close to the disk inner edge and variably scattered towards us.

The early evolution of magnetic activity in very low mass (M and L type) stars - stars near the H-burning limit of 0.08 Msun - is very poorly understood. Yet understanding this evolution is crucial for determining the emerging differences in internal structure between very low-mass stars and brown dwarfs within the first ~100 Myr of their formation.

$\frac{I_X}{I_{\text{bol}}}$, a probe of magnetic activity, is shown for several members of the TWA group (right-data retrieved from Shi et al. 2013). An apparent trend of decreasing $\frac{I_X}{I_{\text{bol}}}$ with later spectral type could indicate changes in magnetic field configuration or increasing neutral atmospheres in these late M-type pre-MS stars. The two TWA 30 A X-ray observations are separated by ~20 years and an upper limit was estimated for TWA 30 B from the July 2011 XMM observation.

At a distance of ~40 pc, the two components of the TWA 30 binary are among the nearest known examples of low-mass, pre-main sequence (T Tauri) stars that show indications of ongoing accretion (Looper et al 2010b, ApJL 714, L45; 2010b, L5, L48, L96). TWA 30A is taken as a wide separation companion to TWA 30B, based on similar proper motions. Both pre-MS stars exhibit forbidden emission lines (SIII, OIII and NII) indicative of outflows and accretion in CTTS. These lines show only small deviations from the stellar rest velocity, suggesting the associated outflows are observed in the plane of the sky and, hence, the disks around these pre-MS stars are observed nearly edge-on.

As illustrated in the figure (right-modified from Looper et al. 2010b), TWA 30 A and B both display near-infrared variability on timescales of days. TWA 30A varies parallel to the reddening vector from Cardelli et al. 1989 whereas TWA 30B follows the classical T Tauri Star locus from Meyer et al. 1997. The contrarvariant behavior between TWA 30 A and B suggests that the near-infrared (NIR) excesses of these two stars have different origins. The NIR excess from TWA 30A likely results from variable degrees of occultation of disk material whereas TWA 30B likely displays reprocessed light emitted by disk structure close to the disk inner edge and variably scattered towards us.

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