POSTER CONTRIBUTIONS (ABSTRACTS)

HYDRODYNAMIC EJECTION OF BIPOLAR FLOWS FROM T TAURI STARS

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If T Tauri stars form, at least in part by way of an accretion disk, then intrinsically bipolar flows arise as natural consequences of this mode of star formation. Taking the vertical structure into account, the orbital energy released as disk matter impacts the protostar is shown to be sufficient to straightforwardly generate pressure-driven winds perpendicular to the plane of the disk. These flows originate from a region much smaller than the entire stellar surface and thus large recombination rates make the flows neutral. This mechanism produces intrinsically collimated motions in contrast with the normal assumption of originally spherical winds constrained by a disk. Disk accretion naturally leads to bipolar flows and may actually *constitute* the T Tauri phase. Symmetrically located Herbig-Haro objects would also be a consequence of this mode of stellar formation.

JETS FROM PRE-MAIN-SEQUENCE STARS: AS 353 A AND ITS ASSOCIATED HERBIG-HARO OBJECTS

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A new Herbig-Haro object, designated HH 32C, has been discovered near the T Tauri star AS 353A. HH 32C is aligned on the opposite side of AS 353A from two previously known HH objects 32A and B. The emission line spectrum of HH 32C shows high velocity blue-shifted material moving at speeds (350-400 km s^{-1}) comparable to the high velocity redshifted material in HH 32A, B. A faint bridge of emission line gas is seen connecting AS 353A with HH 32A, B. Thus, this represents the second case in which HH-objects clearly trace a high-velocity, well-collimated bipolar outflow from the immediate vicinity of a *visible* pre-main sequence object.

Spectra of all three HH objects at 0.5 Å resolution obtained with the MMT echelle spectrograph reveal Hα, [N II] and [S II] line profiles with complex velocity structure ranging from 20 to 400 km s^{-1} but with a different dominant velocity in each knot. Excitation temperature differences between the slow moving knot HH 32A (peak intensity at 60 km s^{-1}) and the fast moving knot HH32B (peak intensity at $\sim$ 260 km s^{-1}) strongly support a model by which these HH objects are interstellar cloudlets accelerated and shock-heated by a jet emanating from AS 353A. This model is supported also by the lower brightness of HH 32B and the two times higher proper motion of HH 32B compared to HH 32A (Herbig and Jones 1983). This means that the shock-heated matter visible in HH 32B is closer to the velocity of the jet than in HH 32A. The obtained high resolution P Cygni profiles of the Hα, NaD and Ca II lines of AS 353A indicate the presence of a strong and cool stellar wind. The Hα absorption extends to a higher negative velocity than does the Na D_2 absorption (also Ca II K with V_{max} = 270 km s^{-1}). The smaller maximum velocity in the lower ionization species suggests