SHORT ORAL CONTRIBUTIONS (ABSTRACTS)

ULTRAVIOLET OBSERVATIONS OF THE T TAURI STARS: INFERENCES REGARDING THEIR CHROMOSPHERES, TRANSITION REGIONS, AND CORONAE

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We have examined the far-ultraviolet (*FUV*) chromospheric and transition region emission lines of several T Tauri stars as observed with the International Ultraviolet Explorer (*IUE*) satellite. Total fluxes and surface fluxes (flux per unit surface area) are derived and compared to those of the other late-type active chromospheric stars. In general, the T Tauri *FUV* fluxes resemble those of the active chromospheric stars. However, the total flux in the *FUV* emission lines is very large, typically 0.1-0.2% of the total stellar luminosity. In addition, some important differences are seen. The strong visual emission stars (Herbig and Rao class e = 4-5) have relatively weaker high temperature lines (NV, HeII, CIV) as compared to the moderate temperature lines (SiII, SiIII, CII). We suggest that in these stars the stellar winds "cool" the transition region so that the maximum temperature attained in the atmosphere is only about 10^5 K (see also the models of Hartmann, Edwards and Avrett). These same stars have not been detected in the X-ray region by the Einstein (HEAO-2) satellite. The weak emission stars (e = 1-3) are also X-ray underluminous but show no peculiarities in the far-ultraviolet. Thus we may be witnessing the birth and development of the corona during the T Tauri stage of protostellar evolution.

DISCUSSION

Walter: It is true, but misleading, to state that the X-ray flux in T Tauri stars is underluminous with respect to the chromospheric fluxes. If you exclude stars like RW Aur and RU Lup, which are not detected as steady X-ray sources the X-ray surface fluxes of T Tauri stars are comparable to those of active main sequence and evolved (i.e., RS CVn) late type stars. It is the lower temperature emission which is overluminous when compared to "normal" stars.

Imhoff: It is true that this is relative. However, we can understand that the X-rays may be underluminous due to the wind, but one might have problems explaining an overluminous chromosphere. I note that only 1/3 of the previously known T Tauri stars have been detected by the Einstein satellite. One that was detected, however, was DG Tauri, a strong emission star like RW Aur and RU Lup, *but* during a flare event.