OBSERVATIONS OF LOW-MASS STARS IN THE PLEIADES: HAS A PRE-MAIN SEQUENCE BEEN DETECTED?

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Haro and Chavira originally discovered a large number of flare stars in the direction of the Pleiades clusters. I have now obtained *BVRIJHK* photometry and low dispersion spectroscopy of a sample of the faintest of those stars. Those data indicate that a significant number of those flare stars lie on the main sequence at least to $V = 17^{m}.0$. Another well populated sequence of stars in the range $15^{m}.0 < V < 17^{m}.5$ is displaced above the main sequence by $\Delta V \simeq 0^{m}.7$. Based on a detailed comparison of the photometric and spectroscopic properties of those two sequences, the brighter sequence appears likely to be composed of binaries rather than pre-main sequence stars. If that interpretation is correct, then the theoretical pre-main sequence contraction timescales for $M \simeq 0.3\ M_{\odot}$ stars calculated by Grossman *et al.* (1974) are in error by at least a factor of five.

X-RAY EMISSION FROM YOUNG STARS AND IMPLICATIONS FOR THE EARLY SOLAR SYSTEM

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Recent observations of soft X-ray emission from solar-type stars obtained with the Einstein X-Ray Observatory indicate that X-ray luminosity is inversely correlated with stellar age. If this result is applied to the Sun and if X-ray emission is a valid indicator of other manifestation of solar activity, then past solar wind and flare levels can be inferred. It can qualitatively explain the excess xenon and nitrogen found in the lunar regolith compared to the level expected from the contemporary solar wind. X-ray emission from T-Tauri and other low-mass pre-main-sequence stars is both highly luminous and variable, indicating the presence of flares $\sim 4\times10^{3}$ times stronger than the largest flares seen in the contemporary Sun. The proton flux from such solar flares during the 10^{6} to 10^{7} year pre-main sequence phase would be sufficient to account for the ^{26}Al anomaly in meteorites.