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## A T TAURI STAR WITH STRONG [S II] EMISSION LINES

The forbidden lines are important in T Tauri stars because they probe the outer parts of the stellar wind and they also give indirect evidence for the presence of disks around the star.

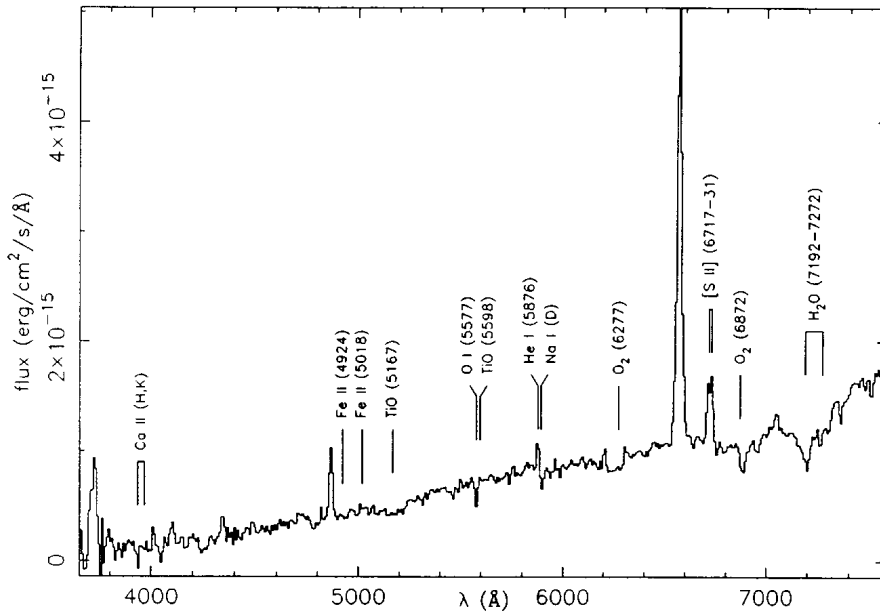
We have secured spectra in the vicinity of NGC 7000 (the North America Nebula) and IC 5070 (the Pelican Nebula), as part of a multifrequency study of young pre-main sequence stars in star forming regions. The spectroscopic observations have been carried out from August 24 to 27, 1989 with the CARELEC spectrograph (plus an RCA CCD detector) attached to the 1.93 m telescope of the Haute-Provence Observatory. The dispersion was 260 Å/mm in the  $\lambda\lambda$  3700-7500 Å range. The 3".2 width slit led to a spectral resolution of about 8 Å. For details of the reduction techniques and spectral classification scheme cf. Mendoza *et al.* (1990). We report herein only the spectrum of LkH $\alpha$  155 (in the Pelican Nebula).

This spectrum (spectral type K3, approximately) shows strong hydrogen lines ( $W(H\alpha) = 98.8$  Å and  $W(H\beta) = 36.7$  Å) and forbidden lines. He I ( $\lambda\lambda$  5876 and 7065 Å), [O II] ( $\lambda$  3727-9 Å) and Ne I (D) are present. The TiO bands are weak. Fe II ( $\lambda$  4924 Å) is most likely absent and Fe II ( $\lambda$  5018 Å) is very weak, if any. The telluric bands ( $\lambda\lambda$  6277, 6872 and 7192-7272 Å) are present; the O I line ( $\lambda$  5577 Å) is present. The most outstanding spectral feature are the [S II] ( $\lambda$  6717 plus  $\lambda$  6731 Å) emission lines ( $W([S II]) = 16.7$ ). The Balmer emission lines, Fe II (42) and the [S II]-doublet do not display clear evidence of P-Cygni profiles (see Fig. 1).

There is no H<sub>2</sub>O Maser known nearby to LkH $\alpha$  155 (see Cesaroni *et al.*, 1988). However, there exists an IRAS source close to this object ( $\approx 1'$  N), 20496+4354; however, LkH $\alpha$  155 lies outside of the uncertainty ellipse of this IRAS point source. Under the assumption that LkH $\alpha$  155 is embedded in this IRAS source, then the luminosity, derived from the infrared fluxes is around 74 L<sub>⊙</sub>. A value higher than typical bolometric luminosities of classical T Tauri stars (Imhoff and Mendoza, 1974).

LkH $\alpha$  155 deserves further study, in particular CCD imaging in U, B, V, H $\alpha$  and [S II] will decide about the T Tauri star and the infrared source. To have a good model of this object it is necessary to acquire high spectral resolution for both the forbidden and the hydrogen lines.

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LkH $\alpha$  155Fig. 1.- The spectrum of LkH $\alpha$  155E.E. MENDOZA<sup>\*1</sup>, Y. ANDRILLAT<sup>2</sup>, and A. ROLLAND<sup>1</sup>

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## REFERENCES

Cesaroni, R. Palagi, F., Felli, M., Catarzi, M., Comoretto, G. Di Franco, S. Giovanardi, C. and Palla, F.: 1988 *Astron. Astrophysics Suppl.*, **76**, 445Imhoff, I., and Mendoza, E.E.: 1974 *Rev. Mexicana Astron. Astrof.*, **1**, 25

Mendoza, E.E., Andriolat, Y., and Rolland, E.: 1990 in preparation