Oph during its 1958 outburst (and subsequent ones).

A few days later, when the rapidly expanding shell ejected from the white dwarf had time to strongly interact with this slowly moving material, its kinetic energy became thermalized by collisions: "coronal" lines of high excitation potential are formed in the surrounding shell: lines of [FeVII], [FeX], [FeXI] and [FeXIV], as well as those of [NiXII], [AX] and [AXI] rapidly increased in strength and reached maximum intensity around August 12. Again, there is a similarity with RS Oph, however, while the coronal spectrum in RS Oph took six weeks to acquire maximum strength, this process took hardly two weeks in V745 Sco. Three weeks later, when the last spectrum was taken, hardly a trace of them remained.

What else was found? V745 Sco is quite faint, even at maximum, and obviously very distant. The interstellar sodium lines show 11 components, produced by distinct interstellar clouds of different radial velocity, as do the calcium lines (the strong interstellar extinction, however, makes the latter ones difficult to observe). We estimate that the interstellar visual extinction is $3^m$, and that the distance to V745 Sco is of the order of 10 kpc; it likely belongs to the galactic bulge.

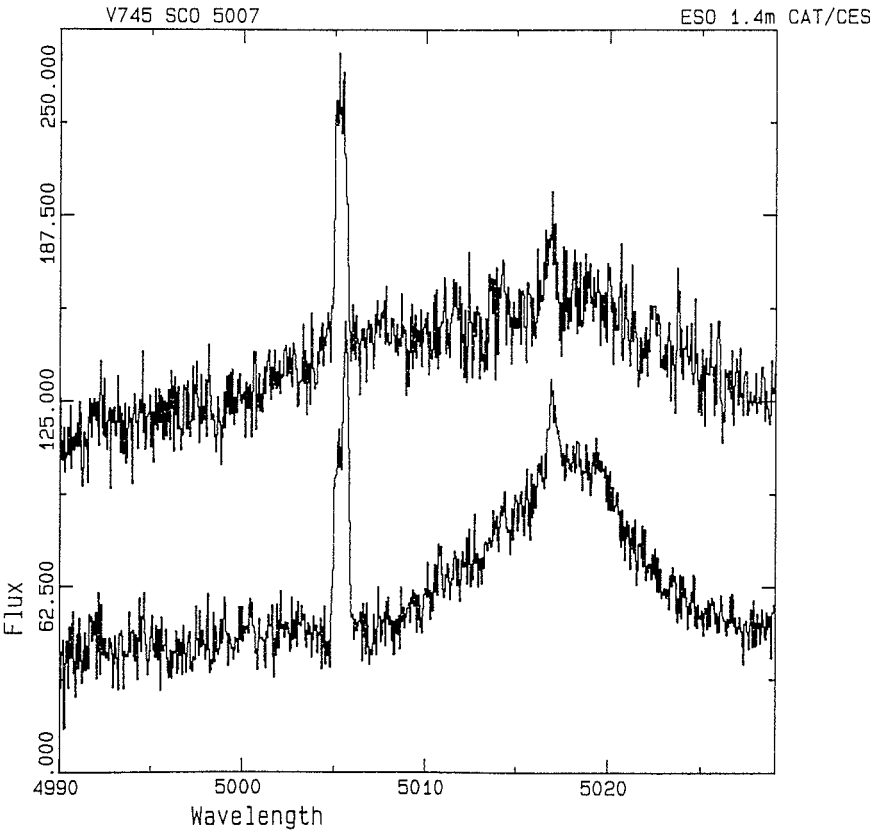


Figure 2: *The region of the [OIII] line at 5007 Å in V745 Sco, observed on August 2 and 4, three and five days after outburst, with the Coudé Echelle spectrometer at the 1.4-m Coudé Auxiliary Telescope by H.E. Schwarz and the writer. Note the different appearance and temporal development of the [OIII] line at 5007 Å and the FeII line at 5018 Å. While the first formed in the wind of the companion, the second arises mainly in the expanding nova shell.*

# Photometry and High Resolution Spectroscopy of Two Southern T Tauri Stars

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## Introduction

In an attempt to determine rotational velocities, photometric rotational periods and possible correlations with chromospheric activity, a sample of southern T Tauri or suspected T Tauri stars was monitored in May 1989 with the CAT+CES 1.5-m and the 50-cm ESO telescopes at La Silla. Unfavourable weather conditions limited our original goals. Nevertheless, some interesting results were obtained. Here we report some preliminary results for two stars from our sample: T Cha and CoD −33° 10685.

**T Cha:** According to the catalogue of Herbig and Bell (1988), no spectroscopic observations of T Cha exist; its T Tauri nature is suggested only by the RW Aurigae-Type variability, and by its location in a dark cloud. The star has a probable photometric period of 3.2 days (Mauder and Sosna 1975). There is also a discrepancy of about $2^m.5$ in the data for the apparent visual brightness of the star given by Mauder and Sosna (1975), and by Mundt and Bastian (1980 and references therein).

**CoD −33° 10685:** This is a fairly well-studied T Tauri star of spectral type K2 (Herbig, 1967), with a rotational velocity $v \cdot \sin i$ = 48 km/s and a visual magnitude of 10.3. It is also a suspected linear polarization variable (Drissen et al., 1989). All these properties make CoD −33° 10685 a good candidate for BY Draconis-type variability.

## The Observations

Owing to the prevailing weather conditions, we decided to limit our observations to the spectral range of the NaI D lines in order to study the outer and colder parts of the stellar atmosphere. Three spectra of each star were taken on three different nights, and the spectra of a number of reference stars were obtained as well. The latter were convolved with different synthetic rotational profiles in steps of 5 km/s over the ve-

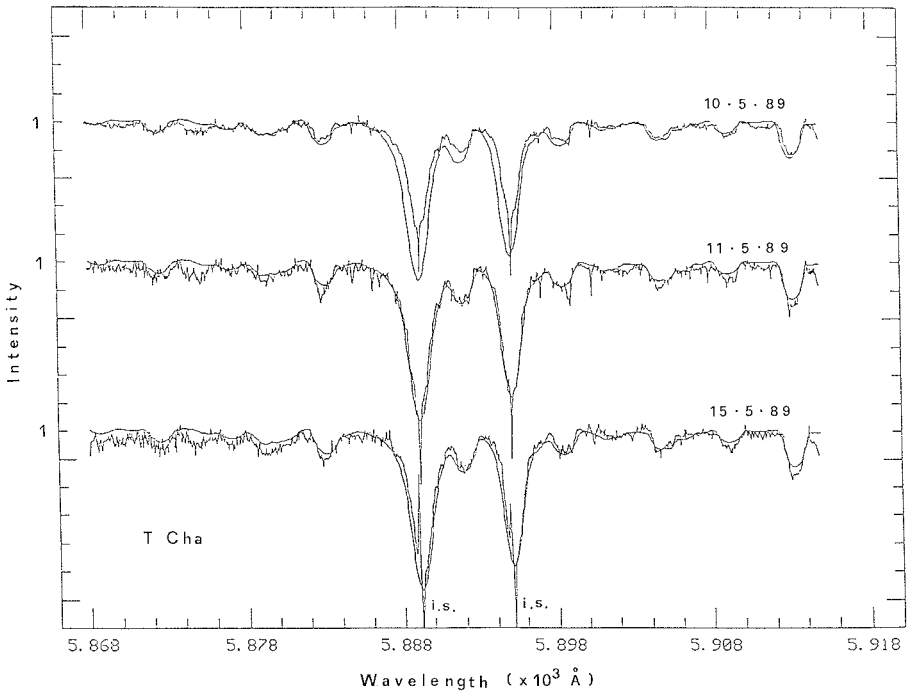


Figure 1: *The spectrum of T Cha observed during the nights of May 10, 11 and 15, 1989 compared with the convolved spectrum of the standard star HD 190248 (G8 V).*

locity range $30 \leq v \cdot \sin i \leq 50$ km/s, in order to obtain spectral types and projected rotational velocities of T Cha and CoD −33° 10685. This procedure was repeated for each available spectrum of T Cha and CoD −33° 10685. The best fits of the convolved spectra with the programme stars are shown in Figures 1 and 2. The estimated spectral types and $v \cdot \sin i$ are reported in Table 1.

Our photometric observations show that the brightness of CoD −33° 10685 was quite stable, with a mean visual magnitude of $V = 10.46 \pm 0.03$. This value is consistent with previous photoelectric observations of the star obtained in the 1977–1979 period by Bastian and Mundt (1979) and Mundt and Bastian (1980).

Mauder and Sosna (1975) report that, during the period between December 1971 and April 1972, T Cha showed

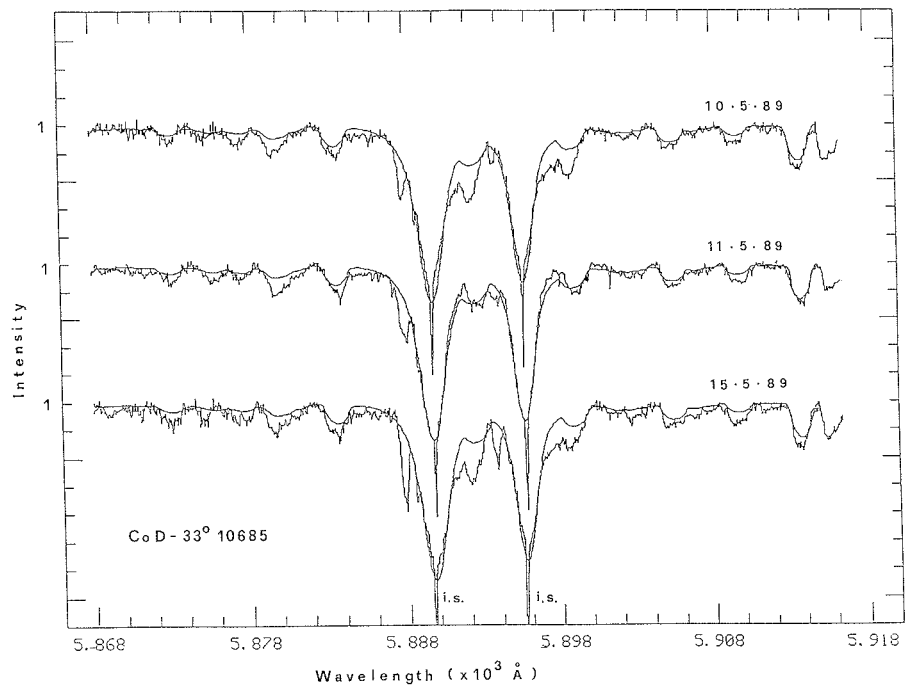


Figure 2: *The spectrum of CoD −33° 10685 observed during the nights of May 10, 11 and 15, 1989 compared with the convolved spectrum of the standard star HD 191408 (K2 V).*

Table 1:

| Star | V | Sp.Ty. | $v \cdot \sin i$ [km s$^{-1}$] |
|---|---|---|---|
| CoD −33° 10685 | 10.46 | K2 | 48 ± 10 |
| T Cha | 10.5 | G8 | 48 ± 10 |

day-to-day visual brightness variations in the interval $15.2 < V < 11.5$, with typical daily changes higher than $1^m$ and a mean visual magnitude of 13.3. The same authors also found a quasi-periodic modulation in the brightness of T Cha, with a period of about 3.2 days. We now find that T Cha has a visual magnitude $V = 10.5 \pm 0.1$, in extremely good agreement with the photometric determinations by Bastian and Mundt (1979) and Mundt and Bastian (1980), but we did not observe any night-to-night changes in the brightness higher than $0^m.1$. If the object observed by Mauder and Sosna and by us is really the same, this means that now T Cha is considerably brighter ($\Delta V = 2.8$) and in a more quiescent phase than in the past.

Our estimates of spectral type and $v \cdot \sin i$ for CoD −33° 10685 are in excellent agreement with those given by Bouvier et al. (1986), and very similar to those found by Finkenzeller and Basri (1987). An inspection of our fits for both stars (see Figs. 1 and 2) suggests that variability might be present in the NaI D lines. To detect any possible night-to-night changes in the line profile, a more reliable comparison was made following the procedure outlined by Finkenzeller and Basri (1985). We simply divided the spectra of the target stars by the processed spectrum of the reference star.

The resulting "profiles" are shown in Figures 3 and 4 for CoD −33° 10685 and T Cha respectively. It can be clearly seen that the spectra of both stars are variable in the NaI D lines on a time scale of one day or less. In the case of T Cha, based on its spectral type, projected rotational velocity, photometric variability, IR excess (Glass and Penston, 1974) and association with a dark cloud, we conclude that it is a low-mass PMS star. In the case of CoD −33° 10685, multiple narrow blue shifted absorptions are superimposed on the emission profile. The most blue-shifted component has variable intensity (by about a factor 2), and a radial velocity of about −92 km/s relative to the star. On the red side, a broad variable absorption is present, with a minimum at +125 km/s relative to the star (see Fig. 3). All these features can be explained by the simultaneous presence of a complex mass outflow and of infalling matter onto the star. The time scales of

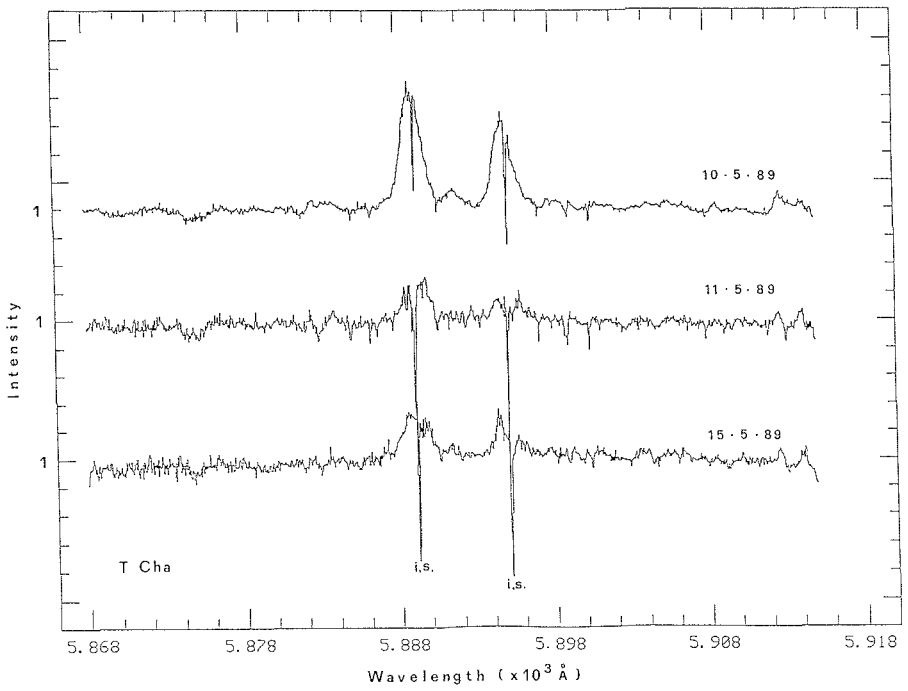


Figure 3: *The ratio between T Cha observed during the nights of May 10, 11 and 15, 1989 and the convolved spectrum of the standard star HD 190248 (G8 V). Radial velocities of blue-shifted and red-shifted components are indicated.*

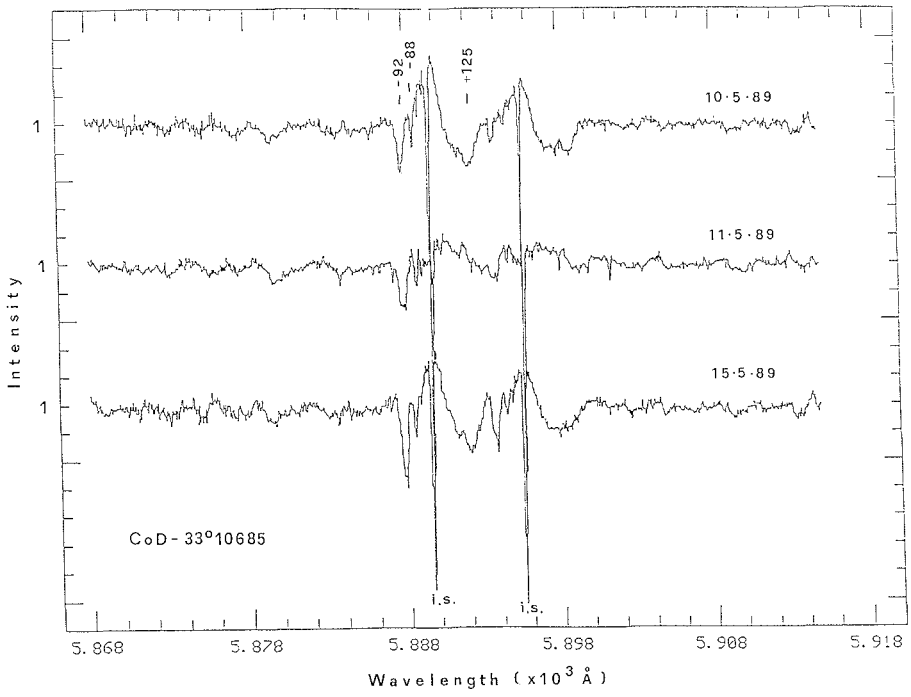


Figure 4: *The ratio between CoD –33° 10685 observed during the nights of May 10, 11 and 15, 1989 and the convolved spectrum of the standard star HD 191408 (K2 V).*

the variations suggest that this occurs near the star surface.

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# STAFF MOVEMENTS

## Arrivals

**Europe:**

DIERCKX, Peter (B), System Manager

KRAUS, Maximilian (D), Mechanical Design Engineer

LIU, X. (RC), Associate

PRAT, Serge (F), Mechanical-Project Engineer

SCHLÖTELBURG, M. (D), Fellow

STIAVELLI, M. (I), Fellow

WANG, L. (RC), Associate

ZUFFANELLI, E. (I), Secretary

**Chile:**

CARTON, Ph. (F), Optical Technician

GIRAUD, E. (F), Associate

HAINAUT, O. (B), Coopérant

## Departures

**Europe:**

AZIAKOU, P. (F), Administrative Clerk Purchasing

FANG, Y. (RC), Associate

GROENEN, E. (B), Assistant Head of Administration

PONZ, D. (E), Science Applications Programmer

**Chile:**

BAUERSACHS, W. (D), Senior Mechanical Engineer

# Discovery of a Low Mass B[e] Supergiant in the SMC


*M. HEYDARI-MALAYERI, ESO*


## 1. Introduction

Peculiar emission-line B supergiants are a group of early-type stars with the following typical characteristics: (a) strong Balmer emission lines frequently with P Cygni profiles, (b) permitted and forbidden lines of FeII, [FeII], [OI], etc. and (c) strong infrared excess possibly due to thermal radiation from circumstellar dust. They represent one of the two main groups of early-type emission line stars in the Magellanic Clouds