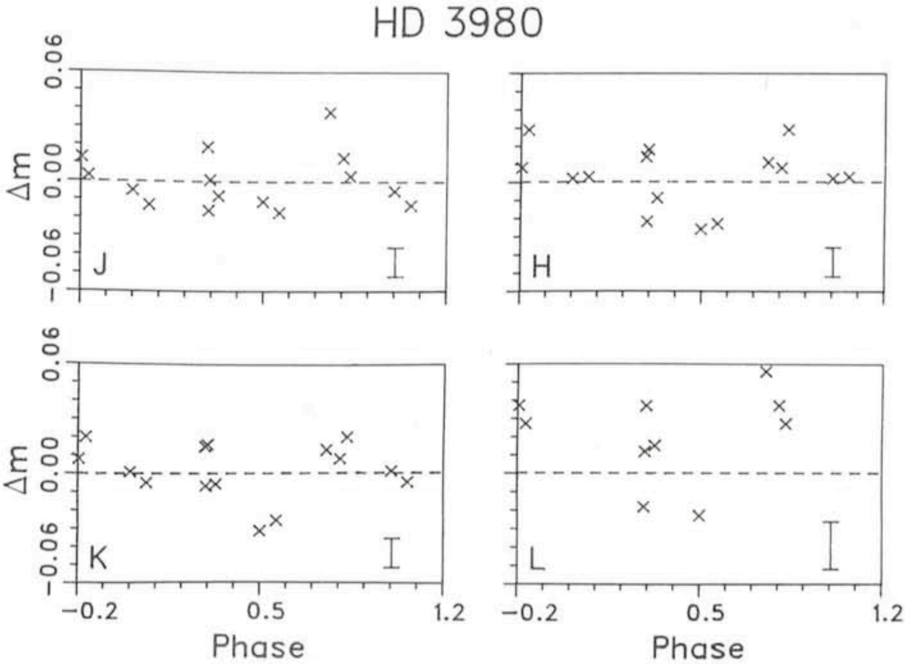

Figure 4: *IR light curve of HD 3980 in four filters. No sign of periodic variability could be found. Mean errors are indicated by the error bars in the lower right corners.*

cause the infrared sky is much more inhomogenous than the visual. We knew that high precision was needed, since our previous data showed that the expected amplitudes would be lower than about 0.03 magnitude.

The first results looked disappointing, one star after the other showed no clear sign of variability, like in the case of the well-known cool CP2 star HD 3980 (Fig. 4). So we reached the final star on our list, α Doradi or HD 29305. Though we had only seven data points per filter, we observed in all filters a clear variation with a mean amplitude of 0.028 magnitude (Fig. 5). The phase shifts and amplitudes are very similar in every filter but, because of the few data, the light curve must be confirmed by subsequent observations.

HD 29305 is a bright silicon type CP2 star, with an effective temperature of about 12,000 K. It has a high projected rotational velocity (v * sin i = 130 km/s, but this value may be overestimated). Together with its rotational period of 2.95 days, this tells us that the rotational axis is tilted close to a right angle to the line of sight. So we have a total exchange of the visible surface after half a period.

In the Rayleigh-Jeans regime, flux and temperature are linearly related, a 3% variation in flux corresponds to a 3% temperature change, which in the case of α Dor gives 350 K. That means, the light minimum phase corresponds to an average temperature, which is 700 K lower than in the maximum phase. Remember, this value is an average over one hemisphere, so actual temperature differences may be much higher.

This observation implies that in this particular star the atmospheric variations may not be explained exclusively by the line blanketing mechanism, since this would leave the effective temperature unchanged.

Since any attempt to map the distribution of chemical elements on the surface of CP stars – and to relate that to the magnetic field configuration – needs a map of the physical parameters first, the infrared light curves may be of great value for such work. Till now, for such work the stellar atmosphere was always assumed to be homogenous in their physical parameters.

We will continue this work in July at La Silla.

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ESO Press Releases

The following Press Releases have been published since the last issue of the *Messenger.*

PR 01/87: Possible Planetary System Photographed Around Nearby Star (31 December 1986; with B/W photo on request).

PR 02/87: Quasar-like Activity in the Outskirts of an Elliptical Galaxy (29 January 1987; with B/W photo and Colour photo on request).

PR 03/87: Bubbles From A Dying Star (20 February 1987; with B/W photo).

PR 04/87: Brightest Supernova Since Four Hundred Years Explodes in Large Magellanic Cloud (25 February 1987).

PR 05/87: Supernova in Large Magellanic Cloud: Overview of First Results (3 March 1987).

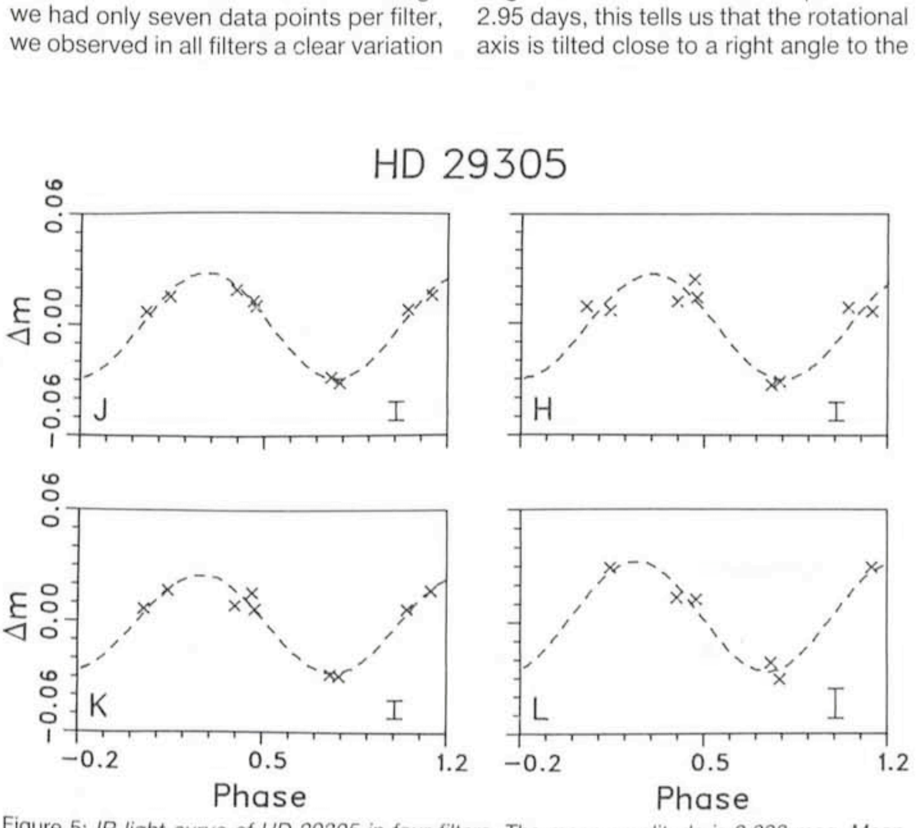

Figure 5: *IR light curve of HD 29305 in four filters. The mean amplitude is 0.028 mag. Mean errors are indicated in the lower right corners.*