

# A SEARCH FOR LONG-TERM PHOTOMETRIC VARIABILITY IN CP2-STARS

H. Hensberge  
Astrofysisch Instituut, Vrije Universiteit Brussel  
Pleinlaan 2, B-1050 Brussels, Belgium

ABSTRACT. Southern bright CP2 stars mentioned in the literature to be constant in light are observed to search for possible variations over months or years. Presently (up to end of April, 1985) four candidate long-period CP2 stars are detected, one of which had already been noticed in the literature as a slow spectroscopic variable.

## 1. OBSERVATIONS

In the frame of the programme of the group "Long-term monitoring of variable stars", a number of bright CP2 stars were observed regularly at the European Southern Observatory, La Silla, Chile. All observations were made relative to two comparison stars.

The stars were selected from the Bright Star Catalog according to the following criteria:

- they were published to be approximately constant over at least one week, and may have a low apparent rotational velocity  $v \sin i$ , or
- evidence for long-term variations in spectral line strength or magnetic field has been found in the literature.

Part of the work is a continuation of a project started by the European ApWG since 1979 (Hensberge et al., 1984). Theoretical background and motives for this search are given in that paper.

## 2. RESULTS

The following stars are suspected to show long-term photometric variations:

HD 94660 = HR 4263	A0p Si	time base line = 5.5years
HD 116458 = HR 5049	Ap SrEu	time base line = 2 years
HD 151771 = HR 6244	B9p Si	time base line = 2 years
HD 187474 = HR 7552	Ap EuCrSi	time base line = 5 years

Except for the latter one, much more observations will be needed

to find the expected periodicity or even proof unambiguously the reality of the smaller variations. The present results for these stars are shown in Fig. 1.

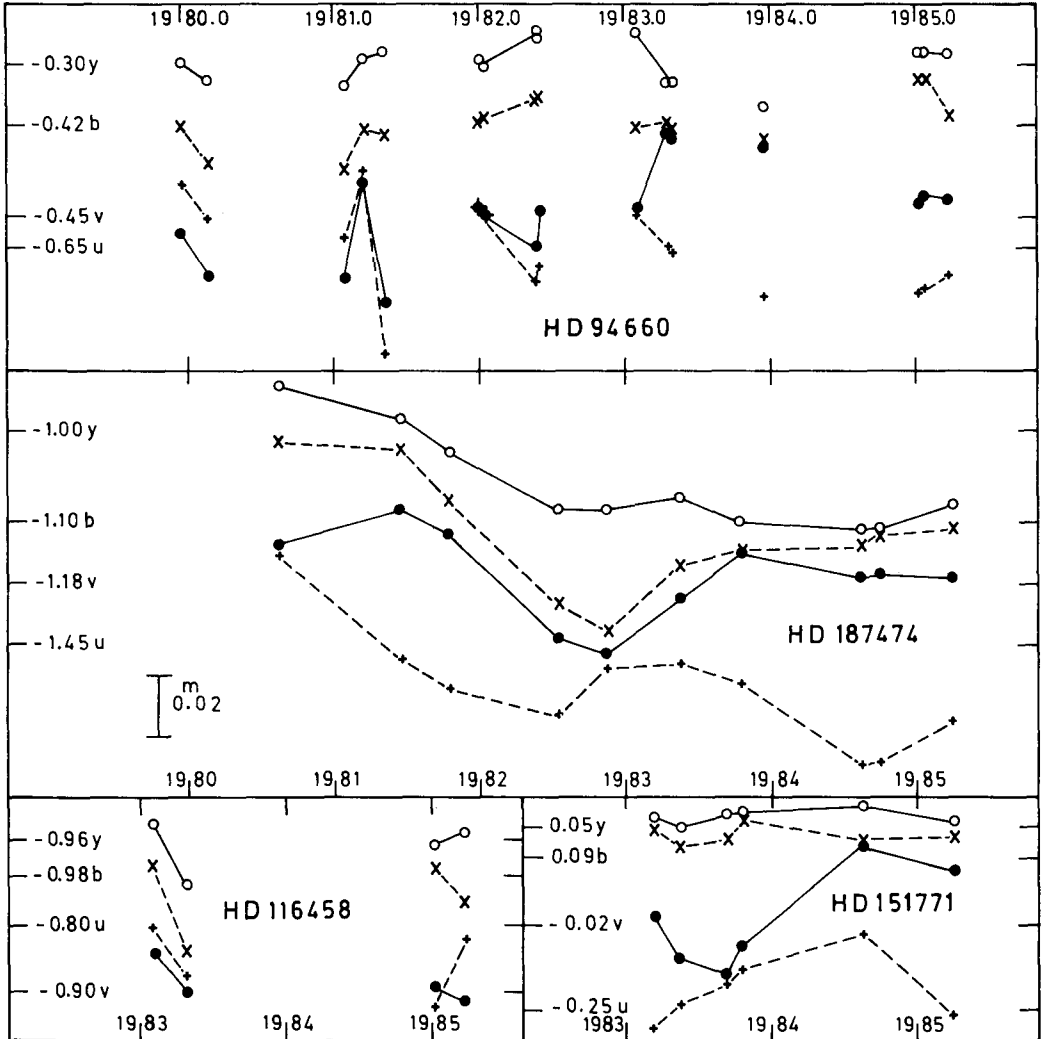


FIG. 1. Differential magnitudes for HD94660-HD94724, HD187474-HD189388, HD116458-HD116579 and HD151771-HD153072 (upper to lower panel resp.). The length of the bar in the left corner of the central panel corresponds to 0.02 mag in the vertical scale of all figures. Different symbols refer to u (+), v (●), b (x) and y (○).

The following stars have been observed without confirmed evidence for variations exceeding the 0.02 mag level:

HD 315 = HR 11	B8p Si	time base line = 450 days
HD 3326 = HR 151	A7p Sr	time base line = 500 days
HD 59256 = HR 2863	B9p Si	time base line = 2 years
HD 71066 = HR 3302	A0p Si	time base line = 5 years
HD 107696 = HR 4706	B9p	time base line = 2 years
HD 191984 = HR 7717	Ap SrCr	time base line = 550 days
HD 201601 = HR 8097	F0p SrEu	time base line = 450 days
HD 221760 = HR 8949	A2p SrCrEu	time base line = 2 years

### 3. CONCLUSION

These results, if interpreted in terms of the oblique rotator model, enhance the best estimate for the fraction of very slow rotators in the CP2 sample of the BS Catalog to 7% with an uncertainty of 2%. This relatively large fraction might be an indication for a large spread in efficiency of rotational braking among magnetic stars.

This work is based on observations by Catalano, Doom, Duerbeck, Floquet, Hageman, Hensberge, Maitzen, Mandel, Manfroid, Ott, Schneider, Schulte-Ladbeck, Stahl, Vander Linden, Weiss and Zickgraf. C. Sterken and J. Manfroid are gratefully acknowledged for the development of the infrastructure (administration and reduction facilities) for the "Long-term monitoring of variable stars"-group.

### REFERENCES

Hensberge, H., Manfroid, J., Schneider, H., Maitzen, H. M., Catalano, F. A., Renson, P., Weiss, W. W., Floquet, M.: 1984, *Astron. Astrophys.* 132, 291.