

## DETECTION OF Am AND Ap STARS BY PHOTOMETRIC MEANS

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The detection of Am and Ap stars is possible in various photometric systems. Those most suitable for this purpose are certainly the uvby $\beta$  (Strömberg 1967, Cameron 1967), the Barbier Morguleff system completed by Gerbaldi (1972, 1977) and the Geneva system. It seems important to me that the Am and Ap stars should be detected with a system which also allows one to classify normal stars, and to obtain quantitative information about metallicity or other peculiarity. The Geneva system satisfies both these criteria and numerous Am (about 400) and Ap (about 250) stars are in a catalogue prepared on magnetic tape by Rufener, which follows the one published in 1976 (Rufener 1976).

The method by which one can obtain a tri-dimensional classification (temperature, absolute magnitude and chemical composition) for the A and F stars is given in two previous papers (Hauck 1968a, 1973).

The parameter  $m_2 = (B_1 - B_2) - 0.457(B_2 - V_1)$  is used as a blanketing parameter. The distance  $\Delta m_2$  to the Hyades sequence in a diagram  $m_2$  vs.  $(B_2 - V_1)$  is an indicator of chemical composition. For the Am stars, we have been able to check the  $\Delta m_2$  is correlated satisfactorily with the  $g = \text{sp}(m_1) - \text{sp}(K)$  parameter defined by Hack (1959). Thus  $\Delta m_2$  will be the parameter by which we can detect the Am stars. Two interesting results were obtained in previous studies: (a)  $\Delta m_2$ , for a given  $(B_2 - V_1)$  is more important for an Am star with a low  $V \sin i$  value than for an Am star with a higher  $V \sin i$  value (Hauck 1968b); (b) in a  $\Delta m_2$  vs.  $(B_2 - V_1)$  diagram we see that the redder Am stars have a higher degree of metallicity (Hauck 1970).

The criteria of detection of the Ap stars in the Geneva system (Hauck 1974) are the following:

- (a) in a  $d$  vs. (B2-V1) diagram (Gerbaldi et al. 1974) the Ap stars are generally below the sequence of reference, and a negative value of  $\Delta d$  can be considered as an Ap characteristic.
- (b) in a (V1-G) vs. (B2-G) diagram, the Ap stars are below the relation  $(V1-G) = 0.289(B2-G) - 0.302$  for the normal stars (Steiger 1974).

$\Delta(V1-G)$ , the difference for a given (B2-G) between the observed value and the value of the sequence of reference, is used as a photometric parameter of peculiarity. This results from the fact that V1 is affected by the 5300 Å feature. At present, 234 Ap stars are measured in the Geneva system and a list updating the first one (Hauck 1976) is in preparation.

Lately Jamar et al. (1977) have shown that a feature was present at 1400 Å in the continuum of the Ap stars (with the exception of Mn stars) and that it is possible to use this feature as a criterion to select Ap stars. There is a good correlation between the  $\delta_{1400}$  parameter of Jamar et al. and our  $\Delta(V1-G)$  parameter. Jamar et al. have also examined the origin of the observed feature in the continuum of the Ap stars. They reach the conclusion that SiIII autoionization lines and FeII lines could be the main agents, the first ones for the hotter Ap stars and the second ones for the cool Ap stars, both effects being added in Si stars where Fe and Si are overabundant.

We have looked in the Geneva catalogue for stars which are photometric Ap star candidates and find that HD 41367, HD 72524, HD 214433, HD 215304 and BD 1<sup>o</sup>2668 could be candidates. We also use the criteria for Am and Ap stars to examine the stars mentioned as Am or Ap stars in the Bertaud and Floquet (1974) catalogue. Thirteen stars of this kind have measurements in the Geneva catalogue and in many cases we are in agreement with the most recent spectral type determination of Bertaud and Floquet (1967). The results of this study will be published in a forthcoming paper.

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