

THE RETICON SPECTROPHOTOMETER AT CIMA EKAR OBSERVATORY

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A spectrophotometer employing linear arrays of Reticon photodiodes has been used at Asiago observatory since August 1977. The first version, with a 128 - element array, has already been described in detail (Barbieri *et al.* 1978). The final configuration has 512 photodiodes, each 50.8 μm high, so that 2-5 cm of spectrum can be recorded in a single exposure. The spectrophotometer is mounted at the focal plane of the Boller & Chivens spectrograph of the 182 cm telescope; with the 600 grooves/mm grating the diode width corresponds to 5.9 \AA . Two other gratings are available, respectively with 400 and 7200 grooves/mm. A fairly sophisticated computer system permits a remarkable flexibility of operation, with real time display on the CRT of the acquired data and recording on mag. tape. To subtract the thermal current and the sky, the star is taken out of the slit by tilting a transparent plate in front of the spectrograph, always under computer control; the astronomer can choose different star/sky exposure times so as to optimize the observing procedure. Guiding can be performed from the control cabinet with an integrating SEC-TV system.

The diode arrays must be cooled in order to reduce the thermal leakage. In the present configuration, the cold face of a thermoelectric cooler is in direct contact with the array, while its hot face is in contact with a refrigerated circulating liquid. The operating temperature is thus around -80°C ; up to 8 consecutive minutes between readouts can be achieved.

An example of the data obtained so far is shown in Fig. 1. The stars were chosen according to observing convenience, in order to cover a broad range of temperatures. The exposure times were

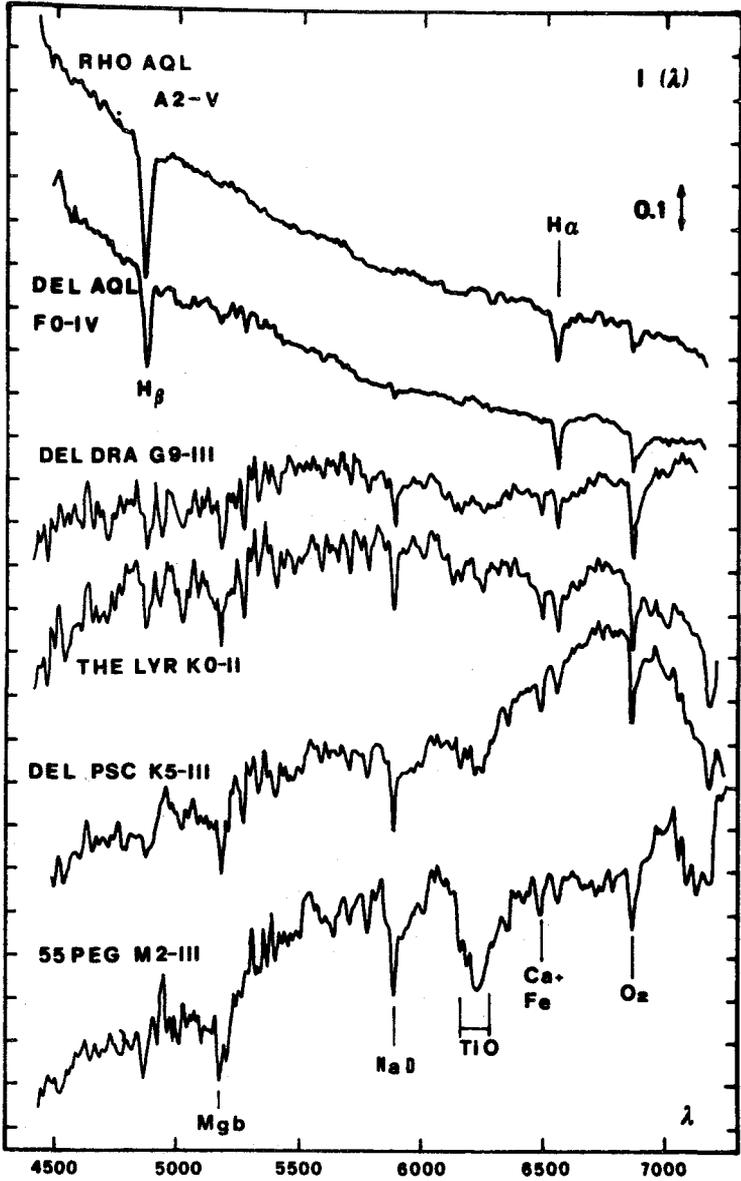


Fig. 1. Six bright stars observed with the 128-element Reticon spectrophotometer; exposure times typically 40 sec per segment.

around 40 seconds. The spectral region covered in Fig. 1 is not however that of maximum efficiency of the Reticón arrays; as is well known, the best quantum efficiency is reached between 6000 and 9000 Å, with useful sensitivity up to 11000 Å. Therefore it is planned to use the instrument essentially longer than H_{α} ; for the visible region of the spectrum an intensified, dural array configuration (known as Digicon) is now under construction and hopefully will be put in operation at the end of the year.

REFERENCES

- Barbieri, C., Bortoletto, F., Canton, G., and di Serego S.A. (1978).
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