PHOTOVISUAL MAGNITUDE DIFFERENCES OF DOUBLE STARS

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Abstract. Differences in magnitudes between the components of 874 double stars have been derived from visual estimates on several series of multi-exposure photographic plates. The plates were obtained with long focus refractors primarily for the purpose of determining the relative positions of double stars according to the well-known Hertzsprung method.

Except for binaries with magnitude differences less than half a magnitude, plates were taken with objective gratings limiting the effective magnitude differences between the components to half a magnitude.

Similar to what has been done in variable star work, it was found possible to estimate the magnitude difference to the nearest tenth from this material by visual inspection, using a seven power eyepiece.

The internal mean error of a single estimate of a magnitude is $\pm 0^m.064$, while the external mean error of a single value in the catalogue based upon an average of three independent determinations is $\pm 0^m.054$.

Comparisons with other photometric series of this type have been made. In particular the photoelectric series by Eggen (1963, 1966) and by Johnson (1953) show close agreements, with no systematic differences.

The results will appear in *Publ. U.S. Naval Obs.*, 2nd Series, **18**, Pt. V.

References

Eggen, O. J.: 1963, *Astron. J.* **68**, 484.
Eggen, O. J.: 1966, *Roy. Obs. Bull.* Serie E, No. 120.
Johnson, H. L.: 1953, *Astrophys. J.* **117**, 361.

Discussion

Franz emphasizes that the extensive plate series available for a number of double stars are an important potential source of information on variable double-star components. For instance, he has reasons to assume that γ Leo might be variable. His observations, though not numerous, show thus far a large dispersion of almost 0.2 mag.

Strand replies that he believes to have found two or three new variable stars. Nothing peculiar was noticed about γ Leo. However, estimates of Δm for each star were generally made on four or five plates at most.

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