Four Ross Variables Identified

James Bedient
jbedient@uclan.ac.uk

Abstract : Four suspected variables, NSV 9124, NSV 9200, NSV 9248, and NSV 9457, detected on photographic plates by F.E. Ross at Yerkes Observatory, are identified as red variable stars.

Introduction

In 1925, F. E. Ross published in the Astronomical Journal the first (Ross 1925) of what would become 10 lists of new variable stars he detected while blinking photographic plates during the search for his famous high-proper-motion stars. No classifications were given; his publication consisted of pairs of observations from plates he made and a series taken by E. E. Barnard about 15 years earlier. In the years since, most of his variables have been followed up or independently rediscovered and catalogued.

A significant fraction remains unexplained, however, and in the interest of resolving the mystery of some of Ross' detections, a search of online data was undertaken. As a result, four of Ross' suspected variables have been identified as red variables, and accurate positions and cross-references determined.

Discussion

Otherwise uncatalogued stars from Ross' lists were first searched for in the International Variable Star Index (VSX; Watson 2006). Many of Ross' stars (e.g. NSV 1488) were found to have been independently discovered by either ASAS (Pojmansky 2004) or NSVS (Williams et al. 2004). Four stars, however, while not noted in either the NSVS or ASAS published catalogues, were found to have sufficient data in ASAS to confirm the presence of a red variable star, along with 2MASS J-K magnitudes consistent with red variables. Details of the four stars follow. Note that the Ross designations are given in SIMBAD form to differentiate between Ross' variables and his better-known proper-motion stars. Cross-identifications for all stars are given in Table 1.

NSV 9124 = SV* R 024. Position 17 32 47.93 -14 37 33.1 (from UCAC2, Zacharias et al. 2004). ASAS data is sparse (see light curve and phase plot, Figure 1) but suggests a Mira-type variable with an epoch of JD 2452053 and a period near 227 days. The V magnitude range is 12.7 to less than 14. The 2MASS J-K magnitude of 1.414 is in line with other Mira variables.

NSV 9200 = SV* R 041. Position 17 36 00.31 -20 31 25.4 (from 2MASS, Skrutskie et al. 2006). ASAS data is again sparse (see light curve, Figure 2) but confirms a red variable-type light curve. The V magnitude range is 12.5 to less than 14. The 2MASS J-K magnitude of 1.610 is well in line with a red variable.

NSV 9248 = SV* R 026. Position 17 37 01.31 -15 06 34.5 (from UCAC2). ASAS has considerable data on this star, but it is near the noise floor of ASAS observations. The light curve is shown in Figure 3 with a phase plot at 126 days. It suggests a semi-regular variable, but lacking data at the faint end, this classification is uncertain. The V magnitude range is 12.7 to less than 14.5. The The 2MASS J-K magnitude of 1.528 is in line with a red variable.

NSV 9457 = SV* R 030. Position 17 40 21.88 -12 06 44.7 (from 2MASS). ASAS data is very sparse, but not inconsistent with a faint red variable (Figure 4). The V magnitude range is 13.6 to less than 14.5. The 2MASS J-K magnitude of 1.523 is in line with a red variable.

Acknowledgements

This research has made use of the SIMBAD database and Vizier catalogue access tool operated at CDS, Strasbourg, France, as well as NASA's Astrophysics Data System.

References

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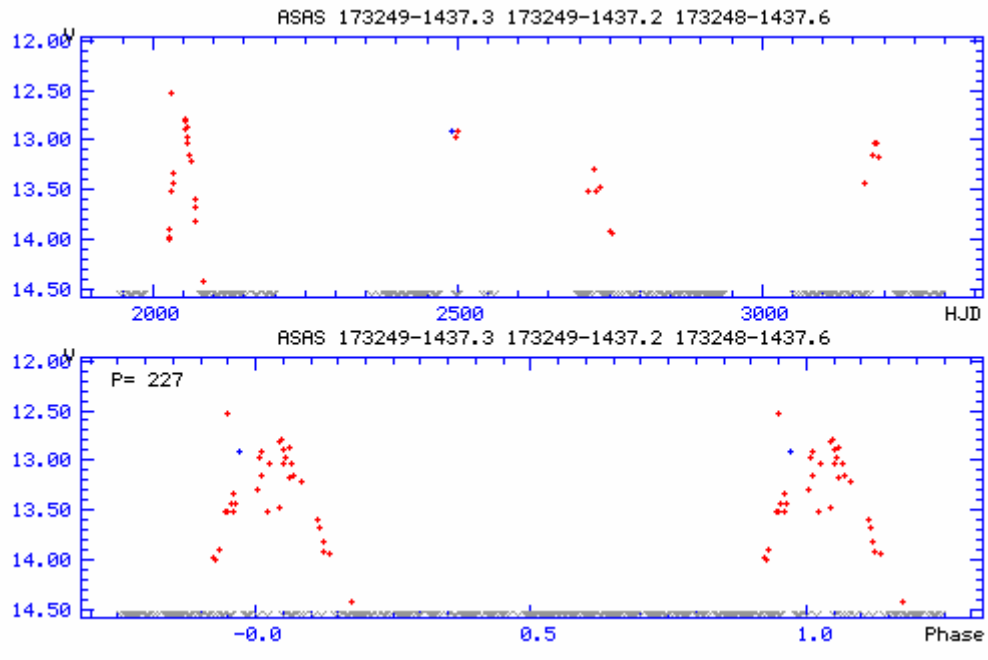

Figure 1 - Light curve and phase plot of NSV 9124 from ASAS.

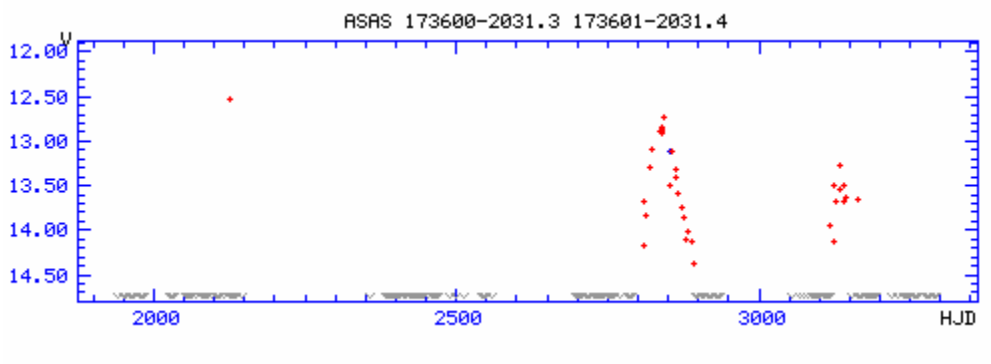

Figure 2 - Light Curve of NSV 9200 from ASAS

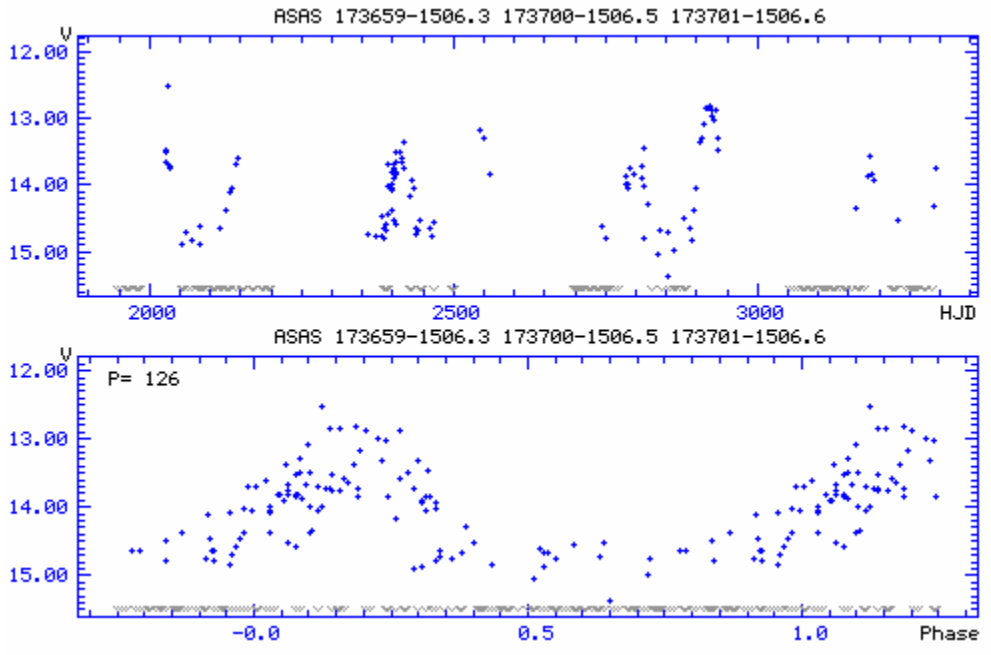

Figure 3 - Light curve and phase plot of NSV 9248 from ASAS

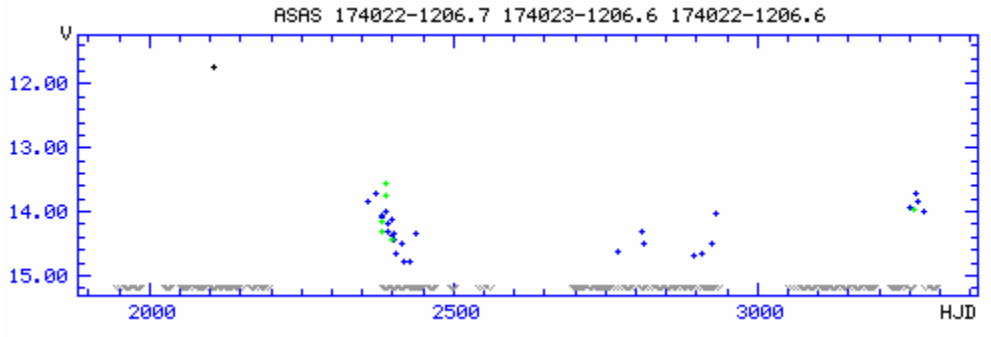

Figure 4 - Light curve of NSV 9457 from ASAS

Star	Cross-IDs
NSV 9124	ASAS 173248-1437.4 2UCAC 26486696 2MASS 17324793-1437329
NSV 9200	ASAS 173600-2031.4 IRAS 17330-2029 2MASS 17360030-2031254 MSX6C G006.0099+06.2890
NSV 9248	ASAS 173700-1506.6 2UCAC 26262896 2MASS 17370131-1506344
NSV 9457	IRAS 17375-1205 2MASS 17402187-1206446

Table 1 – Cross identifications of Ross variables in this paper