

Investigation of EW Eclipsing Binary ASAS J134708-6350.3

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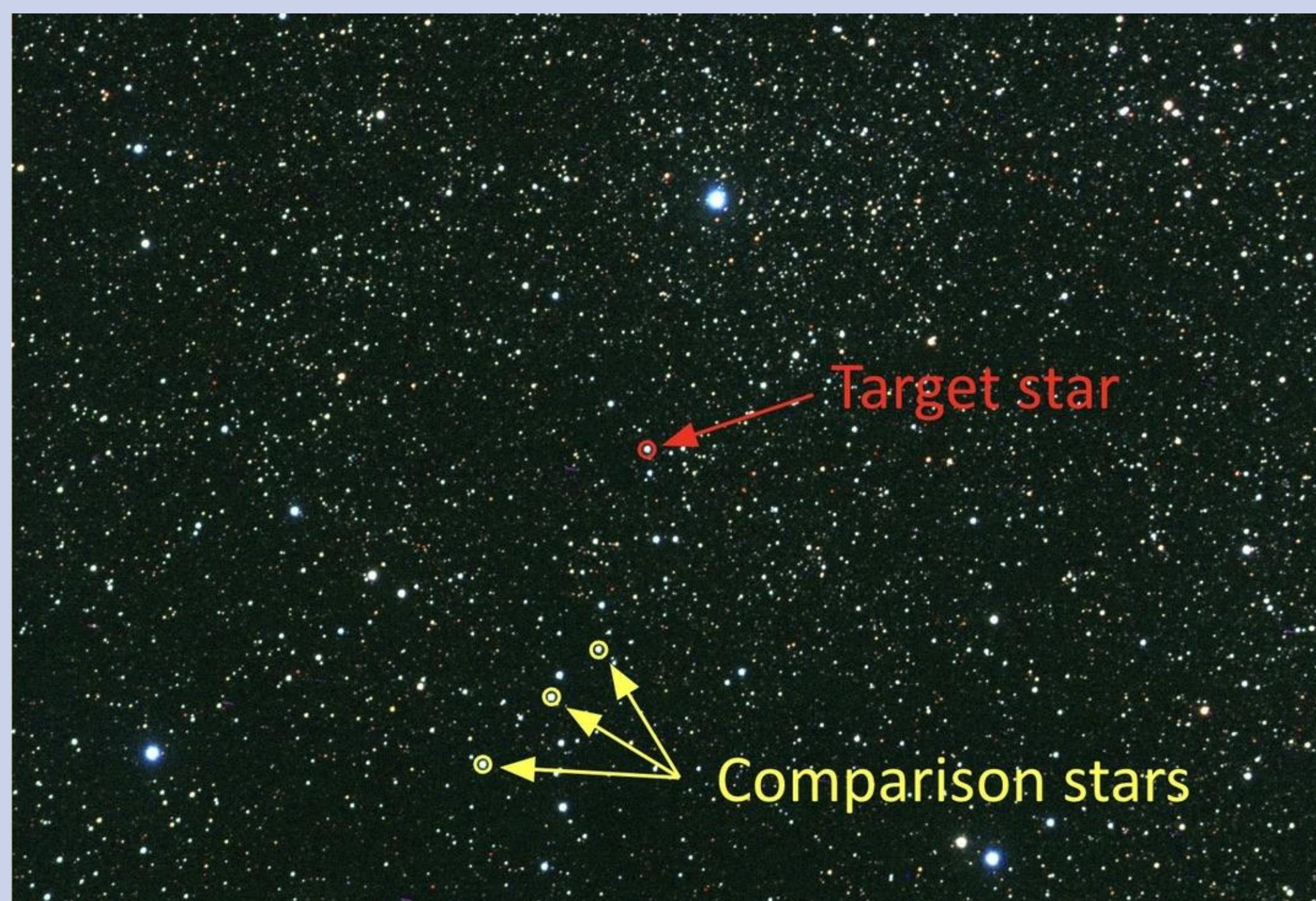
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Introduction

- ASAS J134708-6350.3 has previously been classified as a W Ursae Majoris-type (EW-type) eclipsing binary, or low mass contact binary. This type of eclipsing binary system usually has an orbital period of less than one day and an amplitude varying over less than 0.8 magnitudes.

Methods

- A series of images of ASAS J134708-6350.3 were requested from the Las Cumbres Observatory and combined to make the color composite below.

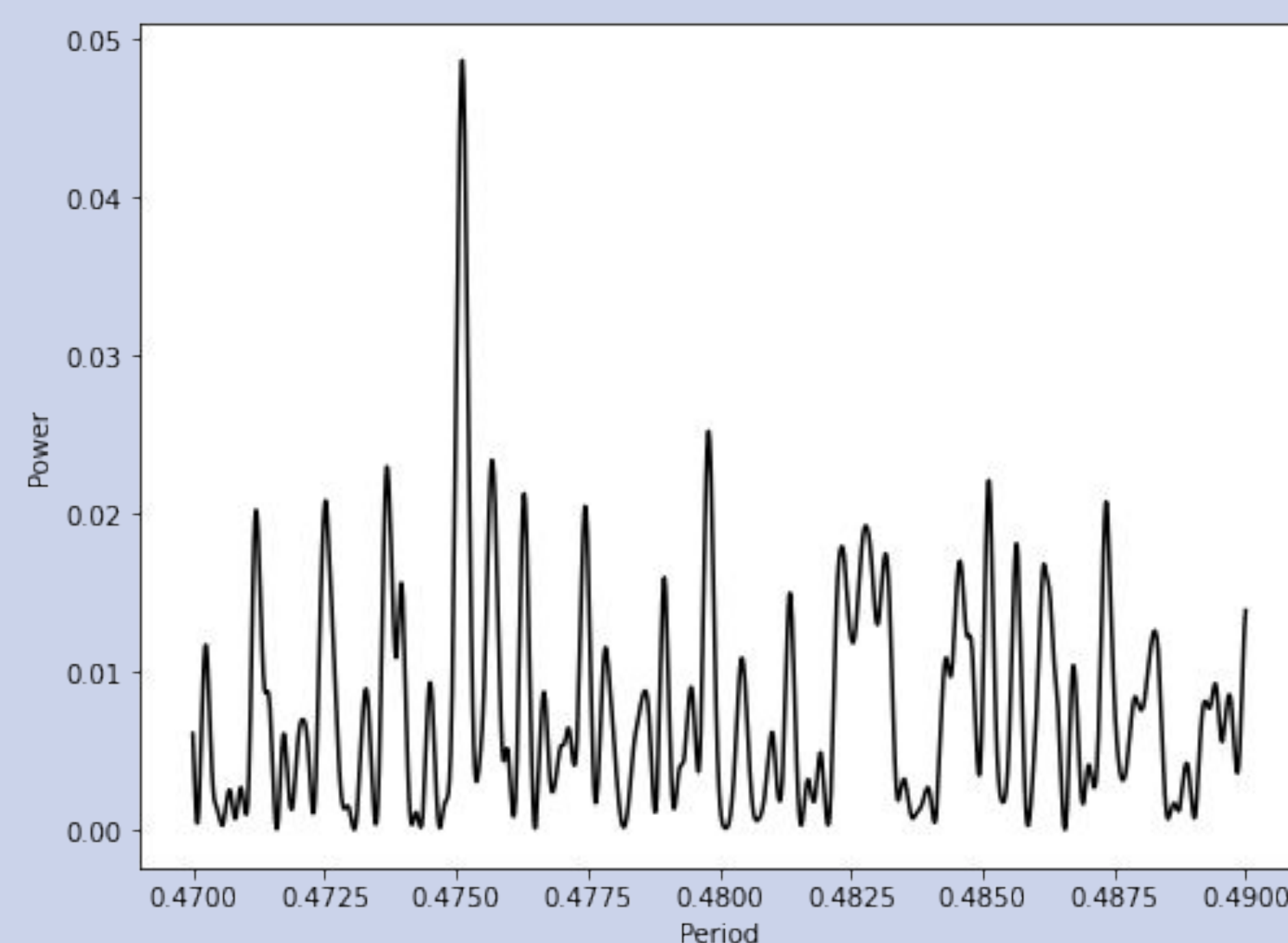


- A periodogram for the system was constructed from historical data obtained from ASAS-SN.
- An ASAS-SN light curve with a calculated V-I color index for the system was created by folding data over the determined period of 0.475093 days.
- A TESS light curve was constructed by folding historical TESS data around the system's VSX epoch and its period calculated from our periodogram.

Results

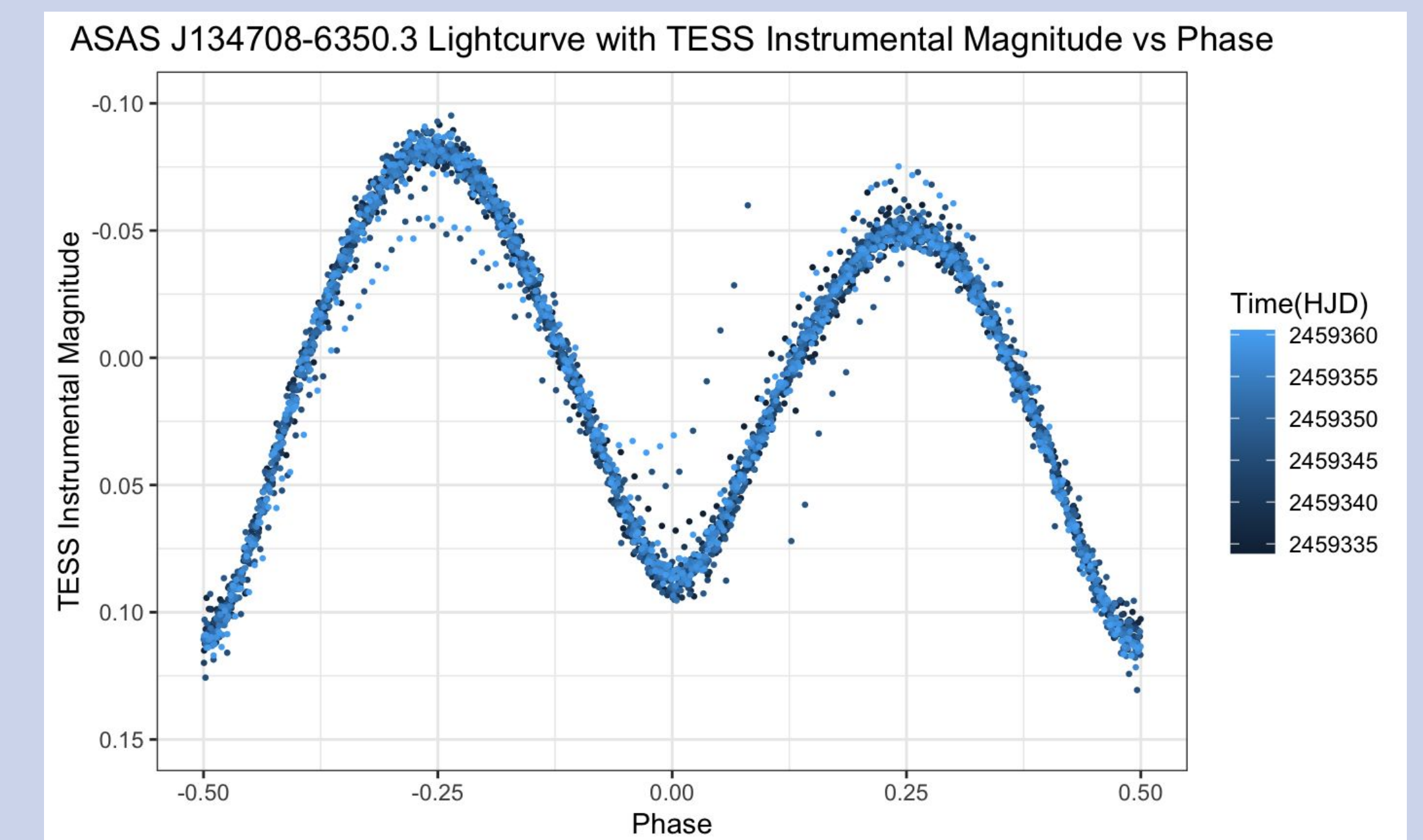
Period analysis

- Our periodogram shows that the period of the system is 0.475093 days or around 11 hours.

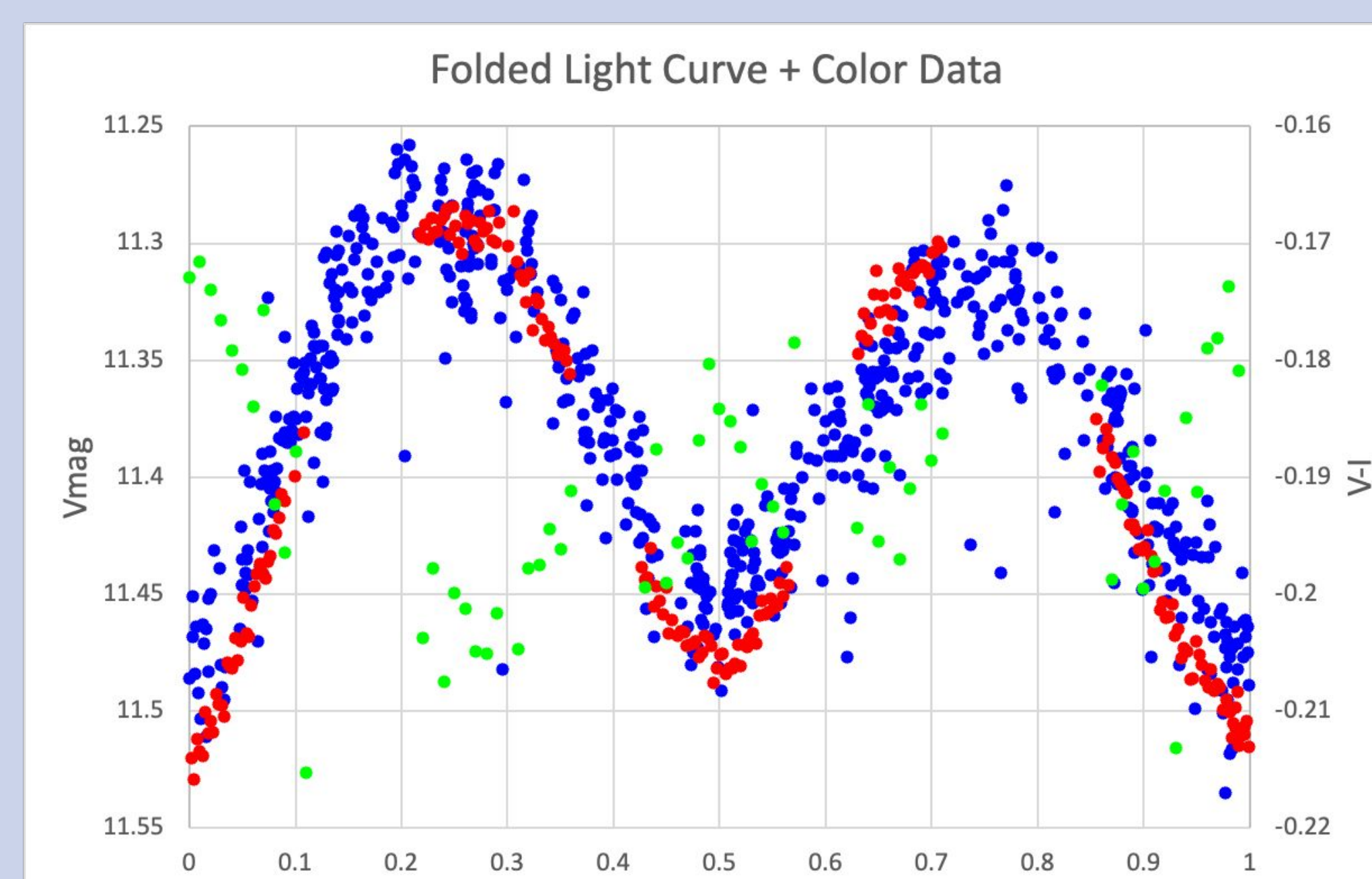


TESS Light Curve

- The TESS light curve corroborates the ASAS-SN light curve since they both have same shape over the same period.



ASAS-SN Light Curve



Blue = historical data from ASAS-SN
Red = data from our images calibrated using Afterglow software
Green = V-I color index of the system

Conclusions

- We confirm that ASAS J134708-6350.3 is indeed an EW-type eclipsing binary as the two characteristic dips of an eclipsing binary's light curve are present.
- The deeper minimum (eclipse of the primary star) has a higher V-I value, which means that the secondary star in front emits more light in the infrared spectrum and is redder than the primary.
- The shallower minimum (eclipse of the secondary star) has a lower V-I value, which means that the primary star in front is bluer than the secondary.
- ASAS J134708-6350.3 exhibits the O'Connell effect, in which the primary and secondary maxima are not the same height. This effect is more prevalently noted in EW-type eclipsing binary systems.

Acknowledgements:



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