

NSV 11003 AND ITS VARIABLE COMPARISON STAR

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Abstract

The elements of NSV 11003 are revised and a neighboring star, until recently used as a comparison star, is confirmed to be variable.

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Eclipsing binary NSV 11003 (Kholopov 1982) is number 155 in a catalogue of Sagittarius variables discovered by Hoffleit (1972). Shining conspicuously nearby is a star that was used at the Maria Mitchell Observatory as part of the comparison sequence until it was suspected of variability by former staff member Leondina Ventura. The present study confirms the variability. An astrometry program currently in use at the Observatory yields these 1950 coordinates for the two variables:

$$\begin{array}{llll} \text{NSV 11003} & 18^{\text{h}} 30^{\text{m}} 07^{\text{s}} & -23^{\circ} 6'.7 & \\ \text{Comparison Star} & 18^{\text{h}} 30^{\text{m}} 10^{\text{s}} & -23^{\circ} 6'.2 & (1) \end{array}$$

The new suspect is easily identified on the finding chart in the Hoffleit paper, just to the northeast of the marked variable 155, and approximately equally bright.

The photographic magnitude of this old comparison star ranges from 10.8 to 11.4 on a time scale of a few days, but so far the star has defied attempts to find a period.

NSV 11003 has proven to be more cooperative. It spans magnitudes from 10.5 to 11.8. Schwarzmman (1980) has published these provisional elements:

$$\text{JD}(\text{min}) = 2444025.73 + 2.145508 n. \quad (2)$$

Since these results were regarded as "provisional," I used a Fourier period search program at the Maria Mitchell Observatory scanning periods between one and ten days. That program produced these elements:

$$\text{JD}(\text{min}) = 2441665.565 + 2.145481 n. \quad (3)$$

I developed a standard light curve from a subset of the observations and compared other subsets to it for O-C evaluation of these elements. The resulting O-C diagram is shown in Figure 1. The new elements for NSV 11003, from a least-squares line through the points, are:

$$\text{JD}(\text{min}) = 2441665.558 + 2.145498 n, \quad (4) \\ \pm 0.014 \quad \pm 0.000010$$

in good agreement with Schwarzmman's provisional elements.

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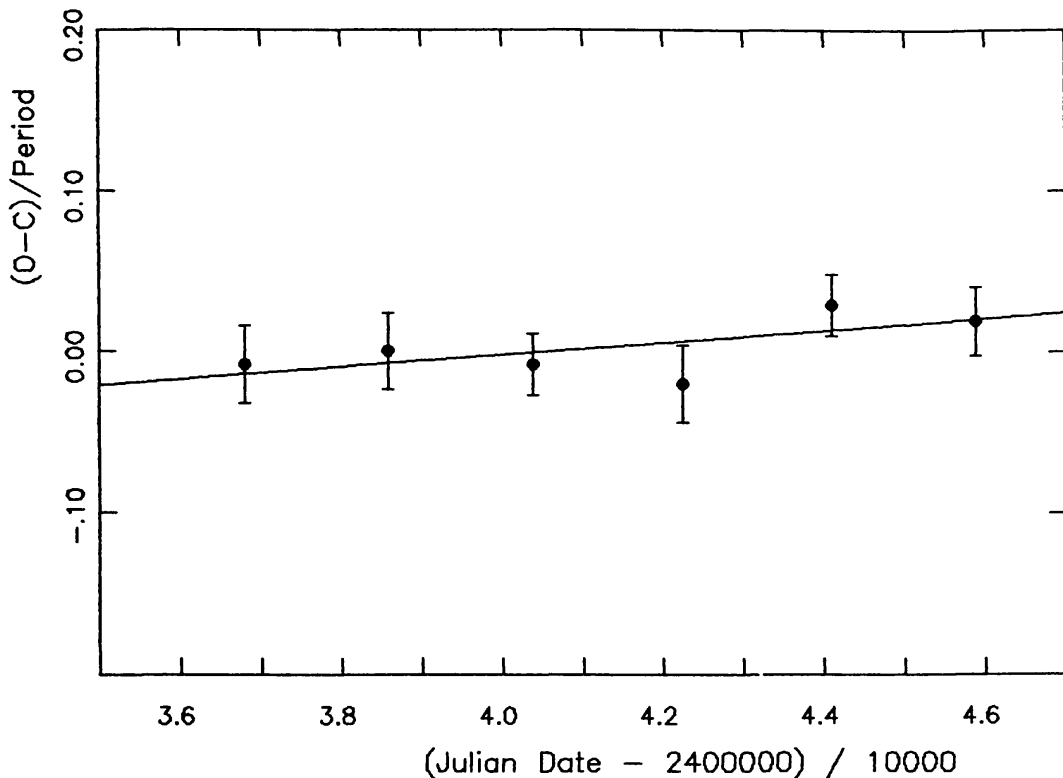


Figure 1. O-C diagram for NSV 11003. Shown is the linear least squares solution. Each point represents five years of observed data.