UNUSUAL BEHAVIOR OF UZ SERPENTIS

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Abstract

A Z Cam-like stillstand in the outburst cycle of the cataclysmic variable UZ Serpentis is reported and several explanations are offered.

1. Introduction

UZ Serpentis is a cataclysmic variable star which has been in the AAVSO observing program since 1950. It is classified in the **General Catalogue of Variable Stars** (Kholopov, et al. 1985) as Type: UGSS. Max: 12.0. Min: 16.7. Per: 26.4d. Spec: Pec(UG). Because of its southern declination the archival data on this star are highly seasonal, being concentrated between April and October of each year.

2. AAVSO Observations

JD 2442000-2444000. The data are very sparse with, at most, 50 data points per 200-day seasonal apparition, insufficient basis for behavior analysis.

JD 2444000-2446000. The data are much more dense, typically 100-200 data points per season. The skeletal outlines of an outburst cycle are visible, with no stillstands apparent.

JD 2446000-2446600. The data are very dense, approximately 300 observations per 200 days. The regular average 26-day outburst cycle is clearly seen, but no stillstands are visible. A sample of the AAVSO data from May to November, 1985, is reproduced in Figure 1.

3. Author's Observations

I have been observing UZ Serpentis regularly with a 44.4cm reflector for three seasons (1985-87) and my data are offered here in graphic form (Figures 2, 3, and 4). It can be seen that the period of unusual stillstand activity began in May, 1987, and continued until October, when several "normal" outbursts re-occurred. The longest bad-weather gaps in the data are 10 days, less than half the normal outburst cycle. The main point is that for 50 observing sessions over 100 days UZ Ser never disappeared from my ken. Another AAVSO observer, Danie Overbeek, recorded observations slightly discordant with mine (owing mainly to use of a different sequence), but agreed (Overbeek 1987; Bortle 1987) that UZ Ser was indeed doing something unusual.

4. Discussion

Several possible explanations of this behavior are worthy of consideration:

1. UZ Ser is a Z Cam star with infrequent stillstands (perhaps one or two per decade) and by chance all the previous stillstands have been missed due to seasonal gaps in the data and limiting magnitude of smaller telescopes used in previous decades.

2. UZ Ser is now in an evolutionary transition from U Gem-like behavior to Z Cam-like behavior.

3. UZ Ser is undergoing some new, unknown change.

I believe that the first hypothesis has the most merit and I urge AAVSO observers to join me in collecting more years of data on this interesting variable star.

REFERENCES

Bortle, J. E., Ed. 1987, **AAVSO Circular**, Nos. 201, 202, 203, 204.
Kholopov, et al.1985, **General Catalogue of Variable Stars**, Fourth Edition, Moscow.
Overbeek, M. D. 1987, private communication.

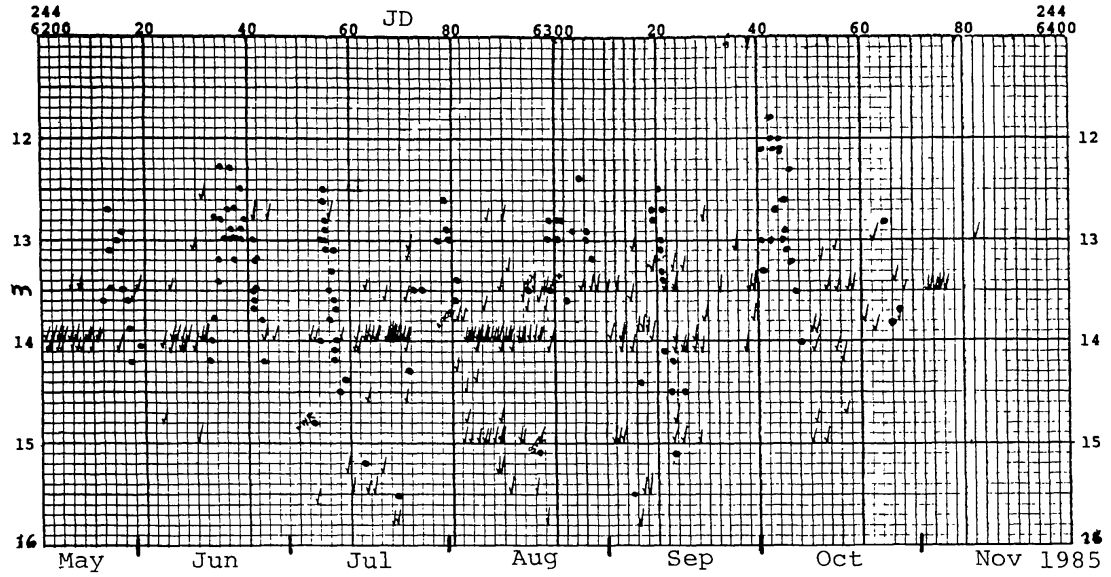

Figure 1. Sample of compiled AAVSO data from archives showing period of regular outburst activity of UZ Serpentis. Dots are positive observations; check marks are magnitudes at which the variable was not visible.

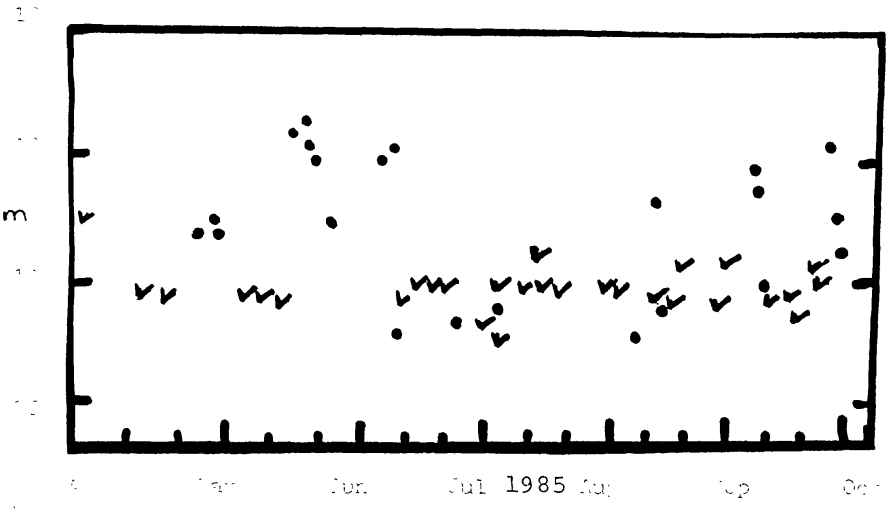

Figure 2. 1985 UZ Serpentis data by G. P. Dyck, JD 2446185 - 2446390. Dots are positive observations; check marks are magnitudes at which the variable was not visible.

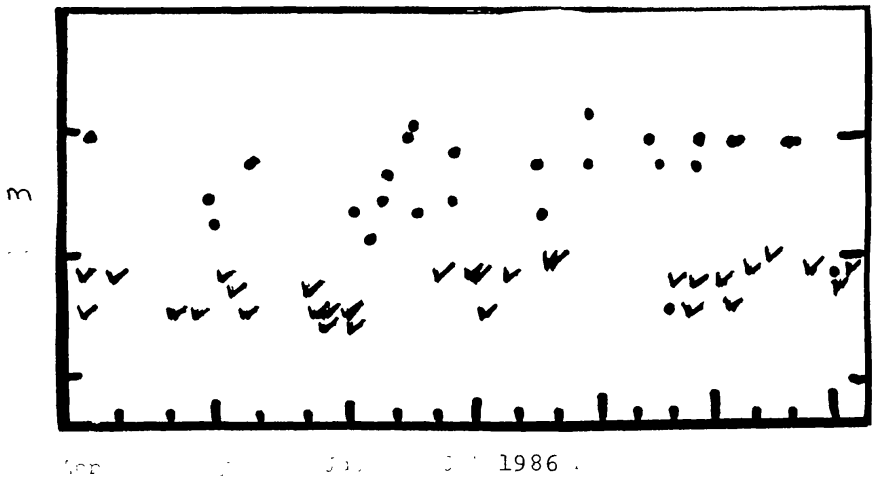

Figure 3. 1986 UZ Serpentis data by G. P. Dyck, JD 2446530 - 2446735. Dots are positive observations; check marks are magnitudes at which the variable was not visible.

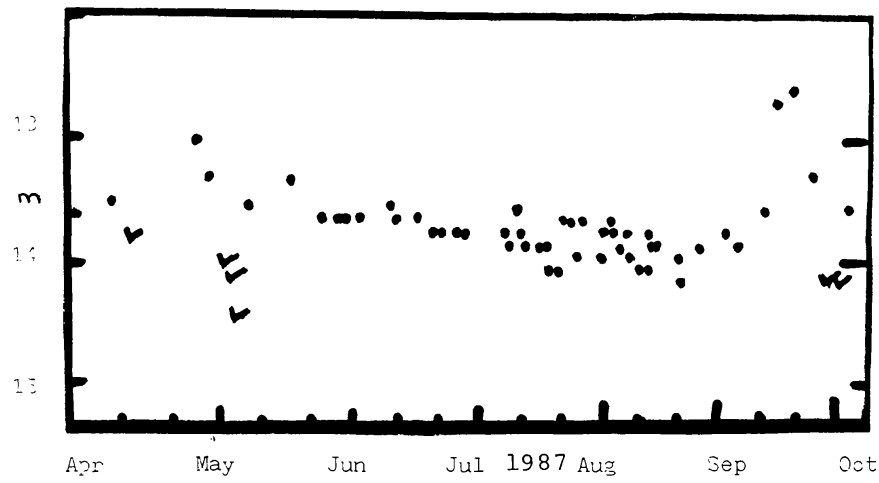

Figure 4. 1987 UZ Serpentis data by G. P. Dyck, JD 2446885 - 2447090. Dots are positive observations; check marks are magnitudes at which the variable was not visible.