

ABSTRACTS OF PAPERS PRESENTED AT THE 78TH ANNUAL MEETING
OF THE AAVSO HELD IN CAMBRIDGE, MA
OCTOBER 27 - 29, 1989

PERIOD-CHANGE RESULTS SUMMARIZED

EMILIA PISANI BELSERENE
Maria Mitchell Observatory
Nantucket, MA 02554

Received 12 December 1989

Abstract

Changes in pulsation periods, based on O-C analyses at the Maria Mitchell Observatory during the past eleven years, are summarized. In the table the direction of period change is given as neither increasing nor decreasing if there is a 5% chance or greater that the observed rate could have come about by chance distribution of the errors in the O-C values. Except for the non-monotonic period changes in the first column, a very large percentage of the observed rates are consistent with evolution theory.

TABLE I

Changes in Pulsation Period

Type	Direction of Period Change				Total
	Both Decreasing	Neither	Increasing		
RRAB	6	3	12	8	29
CWB				3	3
CWA	2	1	1	1	5
DCEP		4	4	1	9
DCEPS	2		1		3
CEP	1		1		2
Total	11	8	19	13	51

* * * * *

DF CYGNI

ARMANDO H. HOWARD
Maria Mitchell Observatory
Nantucket, MA 02554

Received 12 December 1989

Abstract

DF Cygni is an RVb star whose 50-day period is superimposed on a variation in average magnitude which has a period of 775 days. When DF Cyg data are plotted with the 775-day period, the regular RV Tauri variation appears as high-amplitude noise. There are magnitudes from Harvard and Maria Mitchell Observatory plates from the 1890's to 1989. The O-C diagram for the 775-day period shows a decrease at the rate of 0.15 ± 0.09 day per year. The decrease is not smooth, however. The

most recent O-C is later than the trend. It will be interesting to see whether future observations will show the 775-day period increasing again. The next step is to study the 50-day period after removing the longer period.

* * * * *

SAO 23229 - A NEW SEVENTH-MAGNITUDE ECLIPSING BINARY

DANIEL H. KAISER
2631 Washington Street
Columbus, IN 47201

Received 27 February 1990

Abstract

Photographic observations indicate that SAO 23229 is an eclipsing binary with a preliminary period of 2.111 days. Photoelectric photometry by Howard Landis and David Williams show a range of 0.54 magnitude V . The secondary eclipse has not been detected, so the true period may be 4.2 days with equal primary and secondary minima.

* * * * *

LONG-TERM VARIABILITY OF MIRA STARS

JOHN R. PERCY
Department of Astronomy
Erindale Campus
University of Toronto
Mississauga, Ontario L5L 1C6
Canada

Received 5 October 1990

Abstract

Kowalsky *et al.* (1986) have recently compiled a data base containing the times and magnitudes of maximum and minimum brightness of 391 Mira stars, derived from AAVSO visual observations from 1900 to 1975. This data base has been used to examine the long-term behavior of the periods, amplitudes, and mean magnitudes of these stars. The following types of long-term variability have been found; examples will be shown and discussed in the paper:

1. **Period Changes:** Although a few Mira stars show evidence for systematic period changes, perhaps due to evolution, most show random period changes which are more likely due to the accumulation of small period changes from cycle to cycle. Evolutionary changes may possibly be detected by averaging each of the 391 (O-C) diagrams, so as to remove the random changes.
2. **Mean Magnitude Changes:** Only sixteen of the 391 Mira stars show significant long-term changes in maximum magnitude (4), minimum magnitude (1), or mean magnitude (11). All but one of these stars (RS Lac, which may be an RV Tauri star rather than a Mira star) are carbon stars, and the changes in the magnitudes may be due to visual obscuration by dust formed in the stars' atmospheres.
3. **Amplitude Changes:** Fifteen of the 391 Mira stars show significant long-term changes in amplitude. No physical property seems to distinguish these stars from Mira stars with constant amplitudes. The cause of the amplitude changes is not known.

This research was supported by the Natural Sciences and Engineering Research Council of Canada, the J. P. Bickell Foundation of Toronto, and Erindale College, University of Toronto. Thanks to Michael Feast for his helpful comments and encouragement.

REFERENCE

Kowalsky, P. et al. 1986, *Journ. Amer. Assoc. Var. Star Obs.* 15, 236.

* * * * *