COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 3368

Konkoly Observatory
Budapest
24 August 1989

HU ISSN 0374 - 0676

THE ELEMENTS OF THE BINARY SYSTEM 44i BOOTIS

The eclipsing variable 44i Bootis is the fainter component of the visual binary ADS 9494. 44i Bootis belongs to W UMa type.

The binary system 44i Bootis was introduced in the photometric observational program of the Bucharest telescope following the IAU indications (Dworak and Oblak, 1987).

The observations of 44i Bootis were made at Bucharest Observatory during 1987 using the 50cm telescope and a photoelectric photometer housing an EMI 9502B photomultiplier. Observations were made in V and B filters. The star FK4 1395 was used as the comparison star.

The mean light curves indicate a change in minima places of approximately $0^p.065$. A Wood program was applied for elements calculation making first a translation of the curve with $0^p.065$.

As initial values of i, T_A, k, r_A the values from Mauder's (1972) work were used.

The elements, calculated from V and B observations, are:

V filter:

$i=64^\circ.26$	$r_A=0.372$	$q=0.510$	$u=0.650$	$\beta=0.250$
$e=0$	$r_B=0.240$	$a_A=0.387$	$a_B=0.248$	$L_A=0.855$
$\omega=0$	$T_A=5250^\circ K$	$b_A=0.372$	$b_B=0.238$	$L_B=0.145$
$k=0.641$	$T_B=4460^\circ K$	$c_A=0.358$	$c_B=0.234$	

B filter:

$i=62^\circ.92$	$r_A=0.362$	$q=0.510$	$u=0.800$	$\beta=0.250$
$e=0$	$r_B=0.230$	$a_A=0.375$	$a_B=0.237$	$L_A=0.896$
$\omega=0$	$T_A=5250^\circ K$	$b_A=0.362$	$b_B=0.229$	$L_B=0.104$
$k=0.632$	$T_B=4378^\circ K$	$c_A=0.349$	$c_B=0.224$	

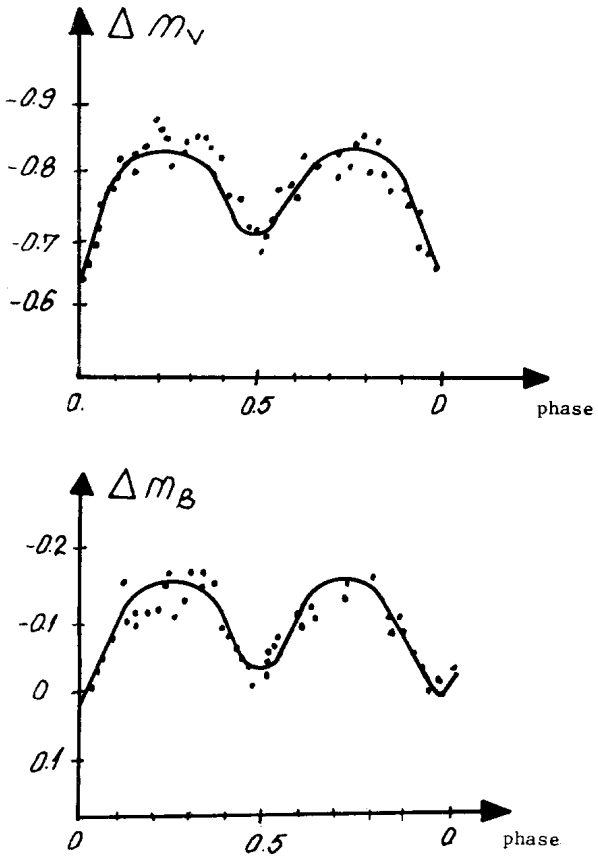

Figure 1

Figure 1 shows the mean observational points by dots and the theoretical values, obtained with Wood program, by curves.

From our observations (Table I) we have calculated four minima and the (O-C) values using: I - Pohl's (1967), II - Duerbeck's (1975) and III - GC 1976 ephemeris:

I Min I =2444366.52904 + $0^d.2678158E$

II Min I =2439852.4903 + $0^d.2678159E$

III Min I =2439370.4222 + $0^d.2678160E$

Table I

Date	(O-C) I	(O-C) II	(O-C) III	Min	σ	Filter	Obs.
244							
6973.3286	0.0145	0.0153	0.0119	II	0.0009	U	Oprescu G.
.3296	0.0155	0.0163	0.0129	II	0.0014	B	"
.3352	0.0210	0.0218	0.0184	II	0.0004	V	"
6977.3550	0.0237	0.0245	0.0211	II	0.0009	U	"
.3510	0.0197	0.0205	0.0171	II	0.0009	B	"
.3557	0.0243	0.0252	0.0218	II	0.0012	V	"
6984.3159	0.0214	0.0221	0.0188	II	0.0003	U	"
.3174	0.0229	0.0236	0.0203	II	0.0009	B	"
.3236	0.0291	0.0298	0.0265	II	0.0010	V	"
6986.3253	0.0221	0.0229	0.0196	I	0.0005	U	Suran M.
.3237	0.0205	0.0214	0.0181	I	0.0007	B	"
.3257	0.0224	0.0233	0.0200	I	0.0007	V	"

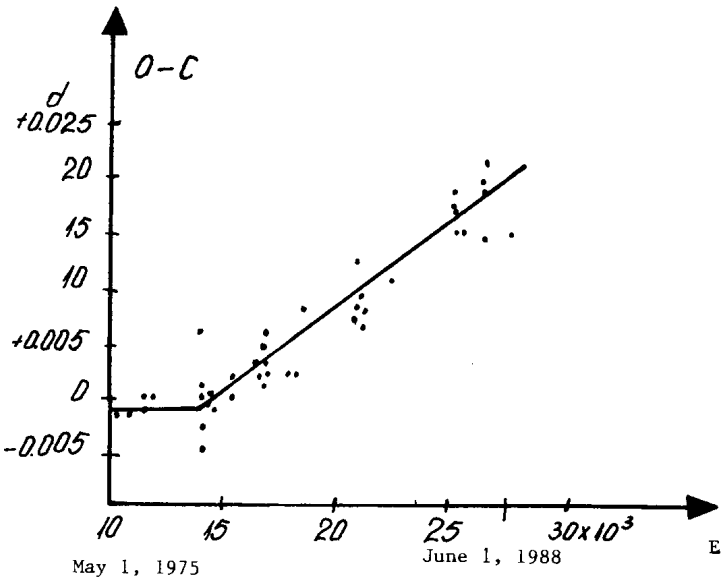

Figure 2

Many authors have pointed out sudden period changes for this star. Using Duerbeck's (1975) ephemeris we obtained the (O-C) values for a lot of minima between 1975-1988. Figure 2 shows a period jump in 1977-1978. The

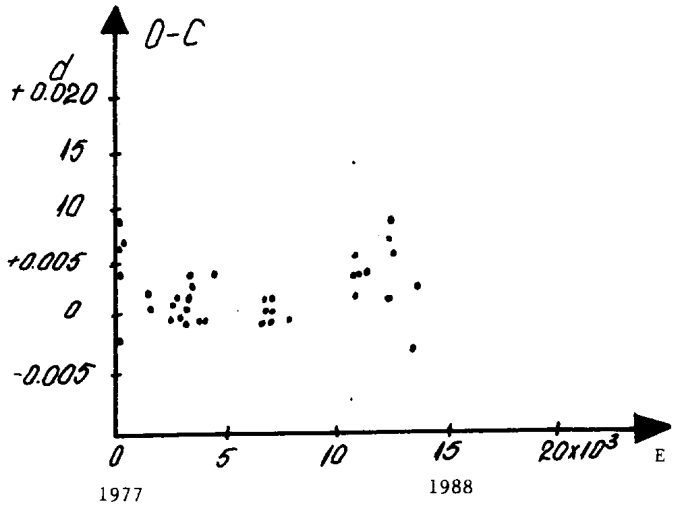

Figure 3

value of this sudden change we estimate to be $\Delta P = 1^d.63 \cdot 10^{-6}$. For the observations after 1977 we suggest a new period:

$$\text{Min I} = 2443604.5880 + 0^d.26781753E$$

Using this new ephemeris we reconsidered the (O-C) values, for the same observations as in Figure 2, beginning with 1977. Figure 3 shows the new (O-C) aspect. A sudden change in period is possible again between 1986 and 1988. More minima observations are needed in the future in order to point out the possible period change exactly.

GABRIELA OPRESCU
MARIAN DORU SURAN
NEDELIA POPESCU
Center for Astronomy and Space Sciences
5 rue Cutitul de Argint, 7000 Bucharest
ROMANIA

References:

Duerbeck, H.W., 1975, I.B.V.S., No.1023
Dworak, T.Z., and Oblak, E., 1987, I.B.V.S., No.2991
Mauder, H., 1972, Astr. Astrophys. 17, 1
Pohl, E., 1967, I.B.V.S., No.209