

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

Number 3674

Konkoly Observatory
Budapest
18 October 1991
HU ISSN 0374 - 0676

FURTHER UBV OBSERVATION OF IU AURIGAE

IU Aurigae (B0p + B1p) is most interesting for its remarkable nature of secularly increasing minima depths since the discovery as an eclipsing binary in 1964 (Mayer, 1965). This phenomenon has been explained by an increasing orbital inclination caused by precession of the orbital plane of the eclipsing system. This precession must be due to presence of a third body in the system, which was also suggested from a periodic variation of the light elements (Mayer 1971; Eaton 1978).

According to Eaton (1979), the orbital inclination is continuing to increase by about 0.5 degree/year, and therefore, with 85° for the inclination in 1979, he suggested that the system may be in central eclipse in 1989. The same thing has been also pointed out by Drechsel and Mayer (1987), with an increasing inclination rate of 0.42 degree/year. In order to check whether this is the case, UBV observations have been further carried out, in succession to the author's previous observation in 1987-88 (Ohmori 1989). The present observations have been made with the same 40-cm reflector at the Science Museum of Kawasaki City during seven clear nights in 1989-90.

During the present observations, HD 35619 (BD+34^o1046) has been used as the principal comparison star. The obtained measurements in mag(var) minus mag(comp) are all plotted in Figure 1. From the present light curve, we can easily deduce amplitudes of 0.^m70 (U), 0.^m66 (B), 0.^m63 (V) for the primary minimum and 0.^m52 (U), 0.^m49 (B) and 0.^m48 (V) for the secondary, as listed in Table I together with all the previous relevant data. As an example, Figure 2 shows a plot of the minima depths in V between 1964 and 1990. It is easily seen in Figure 2 that the minima depths are no longer secularly increasing after 1986. The same tendency can be also seen in variations of the depths in U and B as well. This result is in contradiction with the previous prediction of central eclipse for 1989 by Eaton (1979) and Drechsel and Mayer (1987).

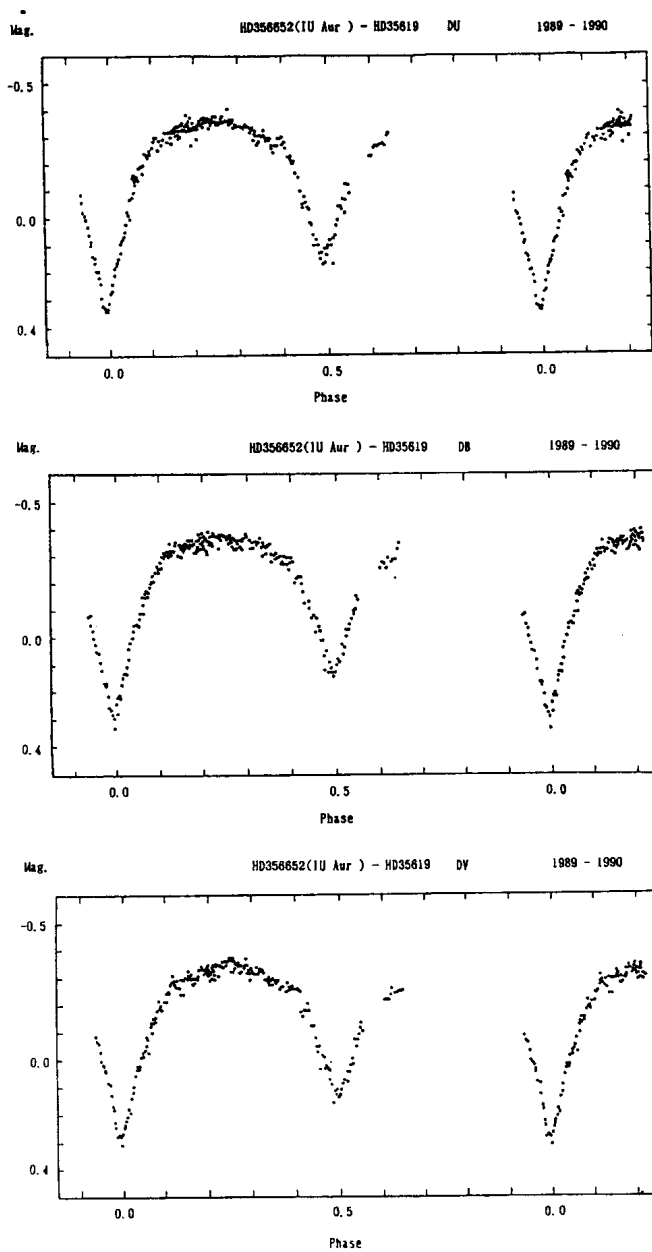


Fig. 1. Light curve of IU Aurigae in 1989-90.

Table 1 Eclipse depths (in mag.) of IU Aurigae

Observation year		1964	1970	1973	1974	1976
Observer		Mayer (1965)	Mayer (1971)	Mayer (1976)	Eaton (1978)	Papousek & Vetesnik (1982)
Prim. Min.	U	0.53	0.60	0.61	0.67	0.71
	B	0.49	0.55	0.58	0.62	0.67
	V	0.48	0.54	0.56	0.60	0.63
Sec. Min.	U		0.46	0.47		
	B		0.43	0.45		0.50
	V	0.38	0.43	0.44		0.48

Observation year		1979	1983	1985	1988	1990
Observer		Eaton (1979)	Mayer & Jozef (1983)	Hui-song (1988)	Ohmori (1989)	This Paper
Prim. Min.	U		0.74	0.80		0.70
	B		0.68	0.74	0.66	0.66
	V	0.68	0.68	0.74	0.64	0.63
Sec. Min.	U		0.57	0.62		0.52
	B		0.55	0.57	0.52	0.49
	V	0.54	0.56	0.56	0.54	0.48

During the present observations, one epoch of the primary minimum has been obtained as JD Hel 2447897.0575 with $O-C = -0^d.1024$, which can be calculated with Mayer's ephemeris (1987): JD Hel 2438448.4068 + 1.811474·E.

I would like to express my thanks to Prof. M. Kitamura of National Astronomical Observatory of Japan for his suggestion of the programme and kind guidance.

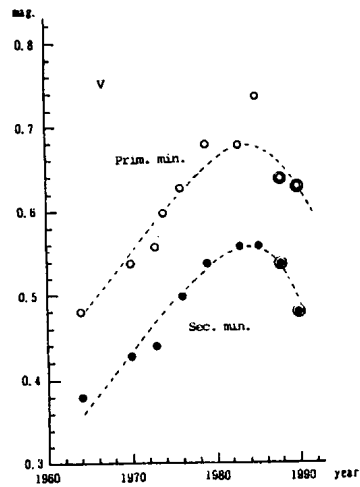


Fig. 2. Variation of eclipse depths of IU Aur in V. Present observations by Ohmori are designated with double circles.

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References:

- Drechsel, H., and Mayer, P.: 1987, *Mitt. Astron. Ges.*, 68, 246.
 Eaton, J.A.: 1978, *Acta Astron.*, 28, 63.
 Eaton, J.A.: 1979, *I.B.V.S.*, No.1614.
 Hui-song, T.: 1988, *Chin. Astron. Astrophys.*, 12, 298.
 Mayer, P.: 1965, *Publ. Astron. Soc. Pacific*, 77, 436.
 Mayer, P.: 1971, *Bull. Astron. Inst. Czech.*, 22, 168.
 Mayer, P.: 1976, *Bull. Astron. Inst. Czech.*, 27, 308.
 Mayer, P., and Jozef, T.: 1983, *I.B.V.S.*, No.2407.
 Mayer, P.: 1987, *Bull. Astron. Inst. Czech.*, 38, 58.
 Ohmori, S.: 1989, *I.B.V.S.*, No.3333.
 Papousek, J. and Vetesnik, M.: 1982, *Scripta Fac. Sci. Nat. Univ. Brno*,
12, 435.