

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 3574

Konkoly Observatory
Budapest
11 March 1991
HU ISSN 0374 - 0676

V1963 Sgr - A new W UMa type star

The variable star V1963 Sgr was discovered by means of infrared photographic observations carried out with the 60 cm reflector at Loiano Astronomical Station (Maffei, 1963). These observations (19 plates in the years 1957 and 1959) together with the ones obtained with the 126 cm reflector at Asiago Observatory (30 plates during the years 1960+1962), were too sparse and sporadic and then allowed to define only the nature of V1963, i.e. an eclipsing variable, probably of type EA; with $P = 2^d.421/n$.

Blue and infrared wide field photographs of the sky region including V1963 Sgr were obtained with the 65/90 cm Schmidt telescope at the Asiago Observatory (104 plates, during the years 1967+1971 and 1975) and with the 40/60 cm Schmidt telescope at the Catania Astrophysical Observatory (129 plates in the year 1980). The photographic emulsions and filter used were: I-N (hypers.) + RG5 for the 117 infrared plates, and 103a-0 + GG13 for the 116 blue ones. All the blue and infrared plates but a few, were obtained in pairs during the same nights. The magnitudes were estimated visually. The errors turned out to be $0^m.05 + 0^m.2$ depending both from telescope and from seeing.

On the basis of the new observations V1963 Sgr seems to be an eclipsing variable of W UMa-type with the following characteristics:

m_{pg}	m_{ir}	Epoch	Period
16.4 -17.4	11.7 -14.0	2440124.3104	1.407205303

Figures 1 and 2 show the blue and infrared light curves derived from all the observations in 1957+1980 corresponding to 5535 periods.

The dispersion of points around the maxima and the width of minima in fig.1 and fig. 2, may be due to occasional variations of the shape of the light curve and/or of the period, both of which are common phenomena in W UMa type stars. The O - C values for the observed primary minima are given in the following table.

J.D 24.....	O - C	J.D 24.....	O - C
36755.5160	0 ^d .055	42688.2560	0 ^d .018
37173.4290	0 .028	44354.5583	0 .189
37190.3545	0 .067	44430.4279	0 .069
39599.3991	0 .065	44437.4297	0 .035
40124.3104	0 .0	44461.3891	0 .072
41068.6244	0 .079	44468.4372	0 .084

The comparison of the light curves shows a normal behaviour in the blue in contrast to a very large amplitude in the infrared.

The color index ($m_B - m_I$) is 3^m.4 at minimum and 4^m.3 at maximum but it cannot be indicative of the spectral type because the system is certainly affected by reddening.

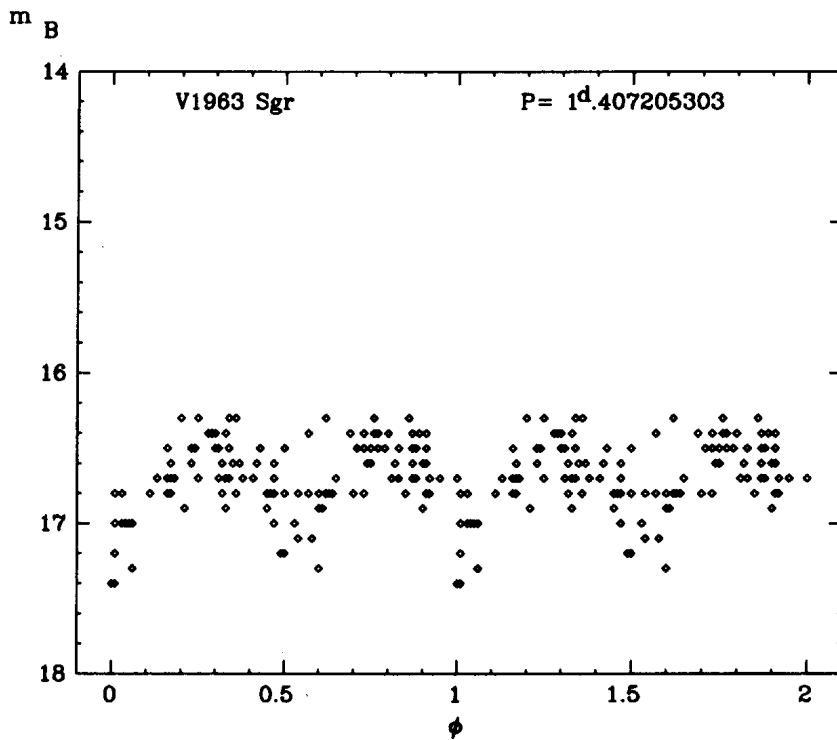


Fig.1

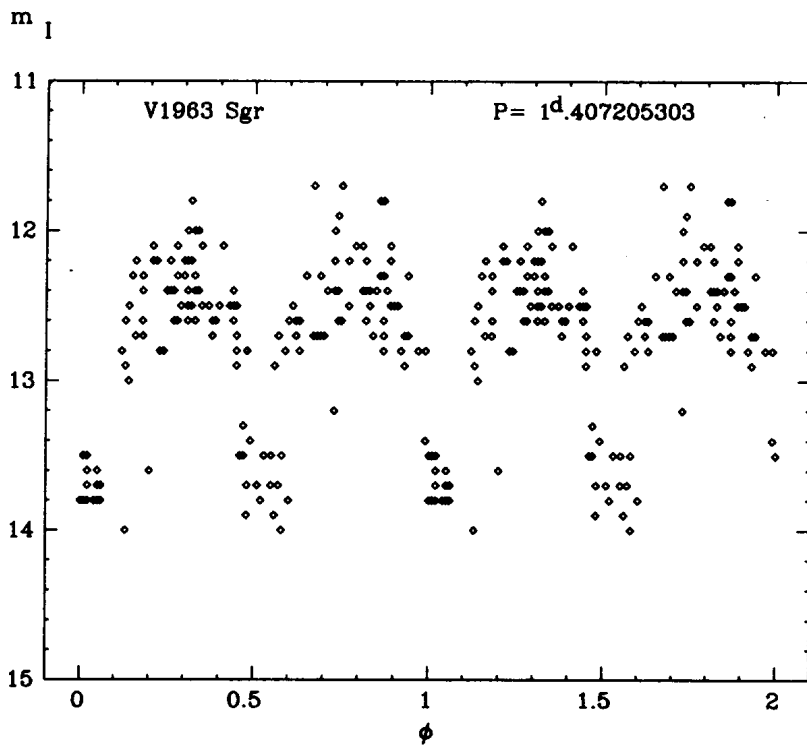


Fig.2

In the *IRAS Point Source Catalog* (1987) there are two sources associated to V1963 Sgr :

NAME	F _{12μ}	F _{25μ}	F _{60μ}	F _{100μ}
IRAS 18164 - 1631	<9.9	22.5	735	<2940
IRAS 18164 - 1632	9.9	<22.5	<869	<2940

These observations strongly support the idea that the system is surrounded by dust typically in the form of a dense circumsystem envelope or disk.

We point out that, according to the 4th edition of *General Catalog of Variable Stars* (GCVS), V1963 Sgr is the first W UMa-type variable discovered with infrared observations. Taken into account that all known W UMa-type stars have been discovered during blue or visual surveys,

we suggest that the systematic infrared surveys may increase the number of the known variables of this type and improve the knowledge of their nature.

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Reference

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