GEOS
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GEOS CIRCULAR ON RED VARIABLE STARS

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GEOS
12 rue Bezout
F-75014 PARIS

PHOTOELECTRIC B AND V PHOTOMETRY OF COMPARISON STARS FOR SEVEN MIRA-TYPE VARIABLE STARS

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ABSTRACT : *PHOTOELECTRIC B AND V PHOTOMETRY OF COMPARISON STARS FOR SEVEN MIRA-TYPE VARIABLE STARS*

The comparison star sequences of 7 Mira-type stars have been observed in two colours, B and V in the Geneva photometric system at the Jungfraujoch Observatory. The stars involved were RR Aql, SY Aql, S Cep, RT Cyg, χ Cyg, V Lyr and AG Peg.

RESUME : *MESURES PHOTOELECTRIQUES B et V DES SEQUENCES DE COMPARAISON DE 7 ETOILES DU TYPE MIRA*

Les étoiles de comparaison de 7 étoiles du type Mira ont été mesurées en 2 couleurs B et V du système de Genève à l'Observatoire du Jungfraujoch. Il s'agit des étoiles RR Aql, SY Aql, S Cep, RT Cyg, χ Cyg, V Lyr et AG Peg.

RIASSUNTO : *FOTOMETRIA IN 2 COLORI B e V DI SEQUENZE DI CONFRONTO DI VARIABILI MIRA*

Le stelle di confronto di 7 variabili tipo Mira (RR Aql, SY Aql, S Cep, RT Cyg, χ Cyg, V Lyr e AG Peg) sono state misurate nei 2 colori B e V del sistema fotometrico di Ginevra all'osservatorio dello Jungfraujoch.

RESUMEN : *FOTOMETRIA EN 2 COLORES B y V de SECUENCIAS DE ESTRELLAS DE TIPO MIRA.*

Las secuencias de comparacion de 7 estrellas de tipo Mira han sido observadas en 2 colores B y V del sistema fotométrico de Ginebra en el Observatorio de Jungfraujoch. Se trata de las estrellas RR Aql, SY Aql, S Cep, RT Cyg, χ Cyg, V Lyr y AG Peg.

1. INTRODUCTION

These observations, made in July 1985 are the follow- up of a work initiated in August 1983 and described in GEOS CIRCULARS SR5 and SR7. These measures are part of the preparation of the Hipparcos astrometric satellite's flight. They were made during a mission at Jungfraujoch sponsored by the PALAIS DE LA DECOUVERTE, Paris.

The instrument was the 76-cm telescope, fitted with a photometer of the Geneva Observatory. The correlation to standard was ensured by frequent observations of standard stars selected from the Geneva catalogue. The method of reduction is described in GEOS CIRCULAR RR7.

The observers were Roland BONINSEGNA, Patrick LOUIS, Philippe ROUSSELOT, Hélène BOITHIAS and Michel DUMONT.

2. SEQUENCE of RR Aql

The sequence was observed on the nights 1985 July 13/14, 17/18 and 21/22. The comparison stars, labelled 1 to 7 are shown on figure 1 and the results are summarized in table 1.

TABLE 1

Star	Date July 1985	U T	Air-Mass	Mv	(B-V)g	Chart magnitude
RR Aql	17	23 h 22	1,51	11,80	1,69	
1	14	1 h 53	1,74	7,051	- 0,441	7,04
1	22	1 h 10	1,69	7,096	- 0,414	
2	14	2 h 00	1,77	8,613	- 0,575	8,9
2	17	23 h 05	1,53	8,572	- 0,547	
2	22	1 h 04	1,67	8,654	- 0,559	
3	17	23 h 44	1,50	10,27	1,10	9,5
4	17	23 h 32	1,51	11,40	0,90	
5	17	23 h 15	1,52	11,605	0,289	
6	18	0 h 09	1,52	11,99	0,37	
7	18	0 h 22	1,53	13,16	0,35	

3. SEQUENCE of SY Aql

The sequence was observed on the nights 1985 July 21/22, 23/24 and 24/25 (figure 2, table 2).

TABLE 2

Star	Date July 1985	U T	Air-Mass	Mv	(B-V)g	Chart magnitude
1	24	1 h 56	1,44	9,617	0,245	
2	24	2 h 01	1,45	10,181	0,054	
3	24	23 h 08	1,20	9,586	0,225	
4	22	1 h 47	1,38	11,709	- 0,229	
5	22	1 h 58	1,41	12,709	- 0,104	

4. SEQUENCE of S Cep (fig.3 and Table 3)

Observed during the night of July 19/20

TABLE 3

Star	Date July 1985	U T	Air-Mass	Mv	(B-V)g	Chart magnitude
S Cep	19	22 h 48	1,22	8,01	5,875	
1	19	23 h 16	1,19	7,298	0,494	7,4
2	19	22 h 41	1,23	9,362	- 0,749	9,0
3	19	22 h 56	1,21	10,013	0,680	9,8
4	19	23 h 27	1,20	10,708	0,957	11,00
5	20	0 h 12	1,18	11,843	-0,272	11,6
6	19	23 h 37	1,19	12,609	0,516	12,4
7	20	0 h 22	1,18	13,006	0,001	13,1

5. SEQUENCE of RT Cyg

The sequence was observed on the night 1985 July 13/14 (fig.4, table 4)

TABLE 4

Star	Date July 1985	U T	Air-Mass	Mv	(B-V)g	Chart magnitude
RT Cyg	13	23 h 46	1,00	9,385	0,667	
1	14	0 h 17	1,01	7,429	0,765	7,6
2	14	0 h 07	1,00	8,454	- 0,479	8,3
3	13	23 h 20	1,00	9,921	-0,741	9,3
4	14	0 h 01	1,00	10,882	- 0,641	10,0
5	13	23 h 52	1,00	11,183	- 0,340	10,8
6	13	23 h 27	1,00	11,945	0,697	12
7	13	23 h 37	1,00	11,433	0,552	11,1

6. SEQUENCE of χ Cygni

The sequence was observed on the nigth 1985 July 12/13 (fig.5, table 5).

TABLE 5

Star	Date July 1985	U T	Air-Mass	Mv	(B-V)g	Chart magnitude
χ Cyg	12	23 h 55	1,03	5,863	1,004	
1	13	0 h 05	1,03	6,474	- 0,750	6,4
2	13	0 h 13	1,03	7,501	0,695	7,5
3	13	0 h 22	1,03	8,177	-0,967	8,2
4	13	0 h 33	1,04	9,099	- 0,171	9,0
5	13	0 h 48	1,05	9,144	0,567	
6	13	0 h 39	1,04	9,646	0,516	
7	13	1 h 00	1,06	11,022	1,165	

7. SEQUENCE of V Lyr

The sequence was observed on the nights 1985 July 11/12 and 24/25 (fig. 6, table 6).

TABLE 6

Star	Date July 1985	U T	Air-Mass	Mv	(B-V)g	Chart magnitude
V Lyr	25	1 h 21	1,27	14,90	0,11 ?	
1 1	12 25	1 h 34 0 h 38	1,17 1,16	9,557 9,694	0,555 0,575	
2	25	0 h 55	1,20	11,204	1,336	
3 3	25 25	1 h 45 1 h 54	1,35 1,38	10,164 10,168	-0,795 - 0,810	
4	25	1 h 49	1,36	10,758	- 0,429	
5	25	0 h 46	1,18	11,611	- 0,236	
6	25	1 h 33	1,30	12,832	- 0,177	
7	25	1 h 05	1,22	13,76	0,62	

8. SEQUENCE of AG Peg

The sequence was observed on the night 1985 July 21/22 (Fig.7 table 7)

TABLE 7

Star	*Date July 1985*	*U T*	*Air-Mass*	*Mv*	*(B-V)g*	*Chart magnitude*
AG Peg	*21*	*23 h 20*	*1,35*	*8,599*	*0,413*	
1	*22*	*0 h 10*	*1,25*	*6,612*	*- 0,972*	*6,602*
2	*21*	*23 h 34*	*1,32*	*8,160*	*0,328*	*8,206*
3	*21*	*23 h 47*	*1,29*	*8,717*	*-0,379*	*8,4*
4	*21*	*23 h 40*	*1,31*	*10,022*	*- 0,448*	
5	*22*	*0 h 03*	*1,26*	*11,400*	*0,867*	
6	*21*	*23 h 54*	*1,28*	*11,660*	*0,297*	

Michel DUMONT

REFERENCES

DUMONT M : *1983, GEOS CIRCULAR RR7*
"Photoelectric observations of CY Aquarii in August 1982 at the Jungfraujoch Observatory".

DUMONT M : *1984, GEOS CIRCULAR SR5*
"Photoelectric B and V band photometry of comparison stars for eight Mira-type variable star fields".

DUMONT M : *1985, GEOS CIRCULAR SR7*
"Photoelectric B and V Photometry of comparison stars for U Cyg and X Oph".

HIPPARCOS INPUT CATALOGUE

New Ground Based Photometry

STANDARD STARS

N° 1	m_v =	7.04	F5
2		8.9	A0
3		9.5 :	
4		-.-	
5		-.-	
6		-.-	
7		-.-	
8			
9			

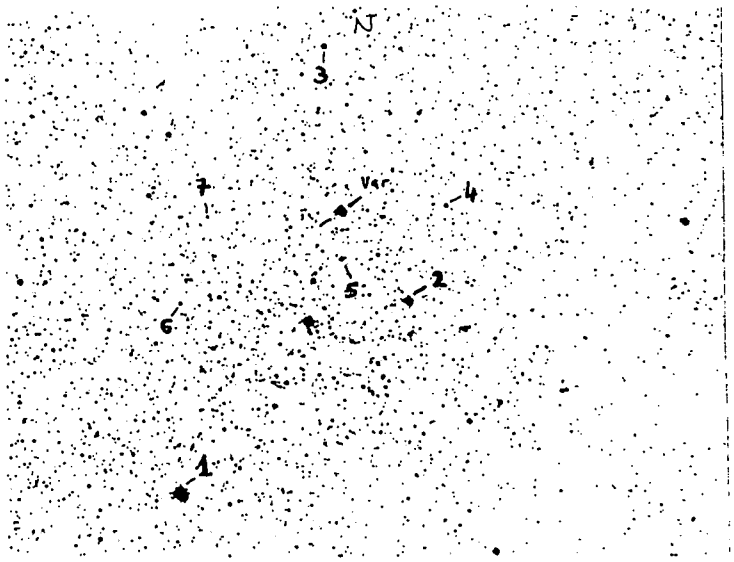


Chart Scale : 1.75 mm/'

VARIABLE : RR Aql m_v 9.0 - 13.9
Spectral type : M6e - M7e

Fig. 1

VARIABLE : SY Aql m_v 9.5 - 14.4
Spectral type :

α 1900 : $20^h\ 02^m\ 24$

δ 1900 : +12° 39.8

DM Number : +12° 4228

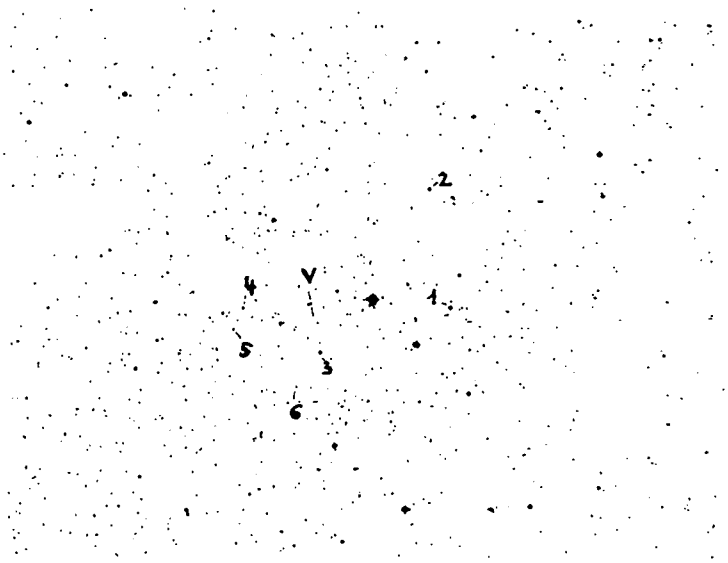


Chart Scale : 1.79 mm/'

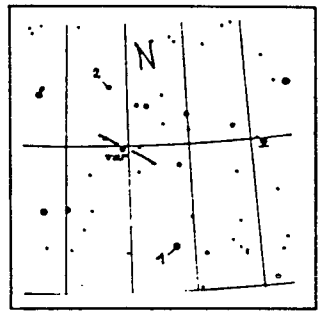
Fig. 2

VARIABLE : S Cep m_v 8.3 - 11.0
Spectral type :

α 1900 : 21h 36 28 α 1985 : 21h 35 24

δ 1900 : +78° 10.5 δ 1985 : 78° 33 28

DM Number :



STANDARD STARS

N° 1	m_v =	7.4
2		9.0
3		9.8
4		11.0
5		11.6 .
6		12.4
7		13.1
8		
9		

Chart Scale : 1.79 mm/'

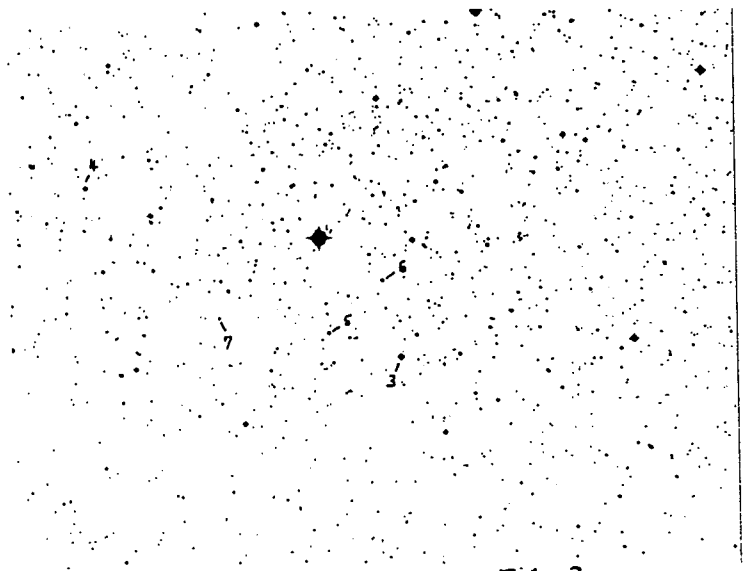


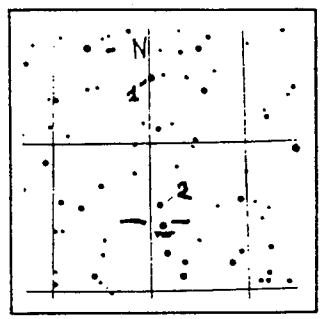
Fig. 3

VARIABLE : RT Cyg m_v 7.3 - 11.8
Spectral type :

α 1900 : 19h 40 47 α 1985 : 19h 43 12

δ 19 : +48° 32.3 δ 1985 : 48° 43 31

DM Number :



STANDARD STARS

N° 1	m_v =	7.6
2		8.3
3		9.3
4		10.0
5		10.8 .
6		~12.
7		11.1
8		—
9		—

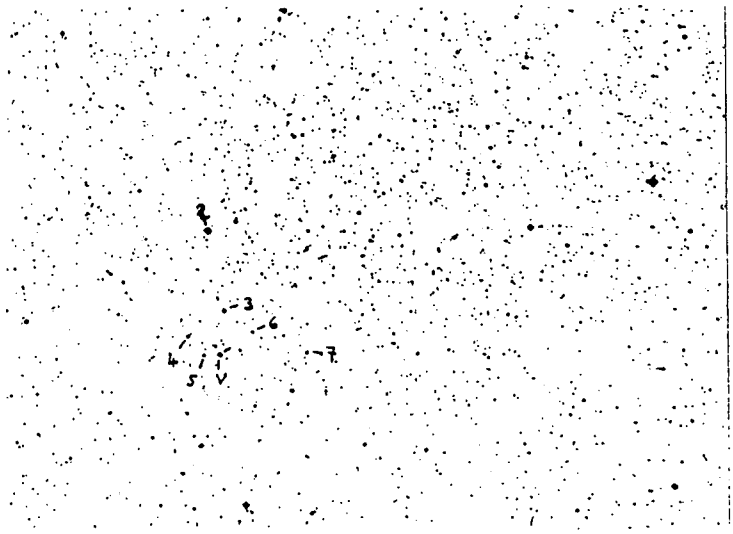
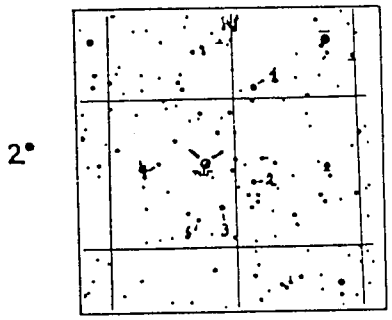


Fig. 4

VARIABLE : χ Cyg
Spectral type : S6c



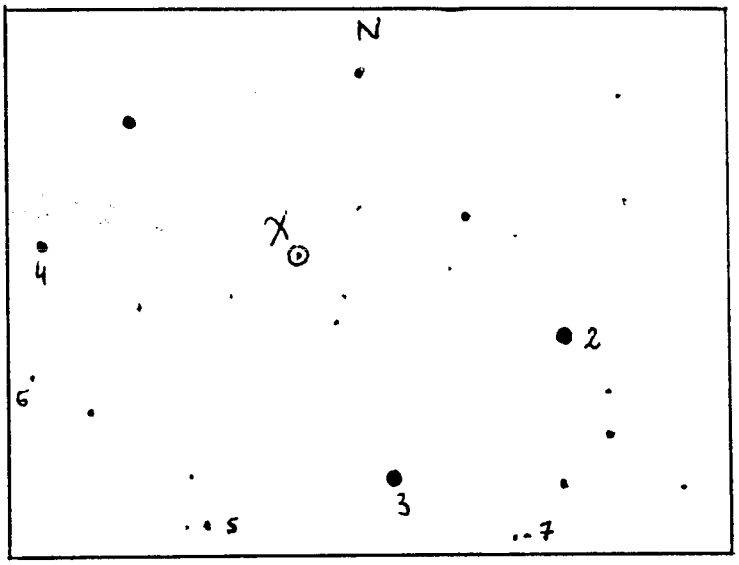


Fig. 5

VARIABLE : V Lyr
Spectral type :

α 1900 : 19h 05m 10

δ 1900 : +29° 29.9

DM Number : BD +29° 3493 a

1.79 mm/'

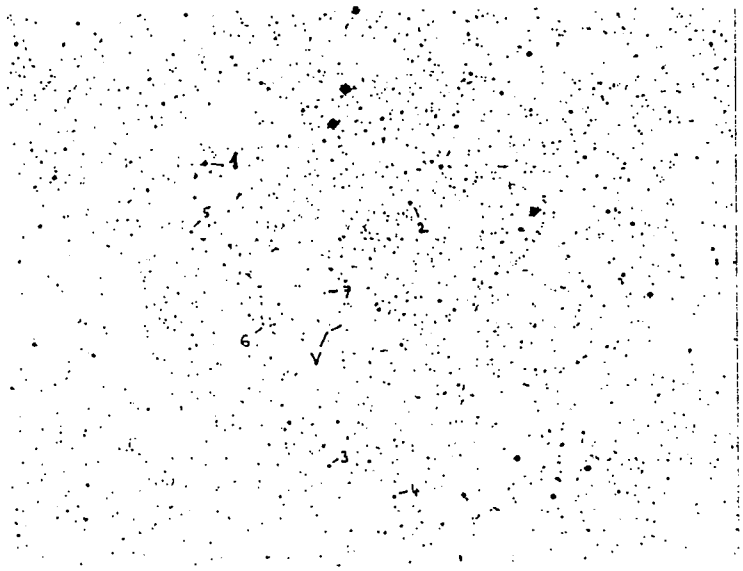


Fig. 6

HIPPARCOS INPUT CATALOGUE

New Ground Based Photometry

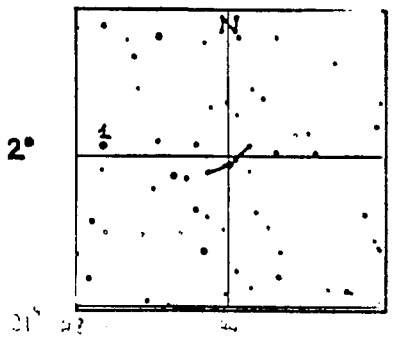
IRREGULAR VARIABLES
PHOTOELECTRIC B,V STANDARD SEQUENCE

VARIABLE : AG Peg m_v 6.0 - 9.4
Spectral type : WN 6 + M4-3 I-III

α 1950 : $21^h 48^m 36^s$ α 1985 : $21^h 50^m 18^{sec}$

δ 1950 : $+12° 23' 28''$ δ 1985 : $+12° 33' 14''$

DM Number : $+11° 4673$



STANDARD STARS

N° 1	m_v =	6.602	B9
2		8.206	ko
3		8.4 :	F8
4		—.—	
5		—.—	
6		—.—	
7			
8			
9			

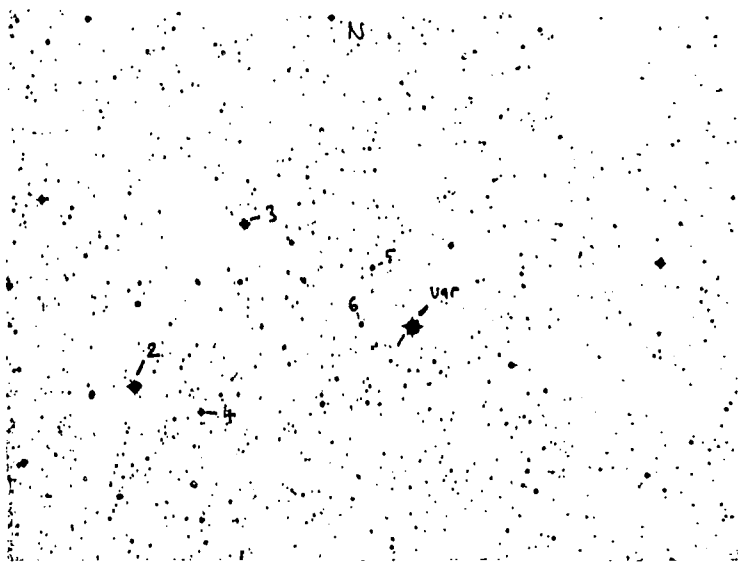


Chart Scale : 1.79 mm/'

FIG. 7