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**NEW M-TYPE VARIABLES IN DARK CLOUD REGIONS**

C. MAGNAN<sup>1</sup>, N.D. MELIKIAN<sup>2</sup>, A.A. KARAPETIAN<sup>2</sup>

<sup>1</sup> GRAAL, Université de Montpellier II, France, e-mail: magnan@graal.univ-montp2.fr

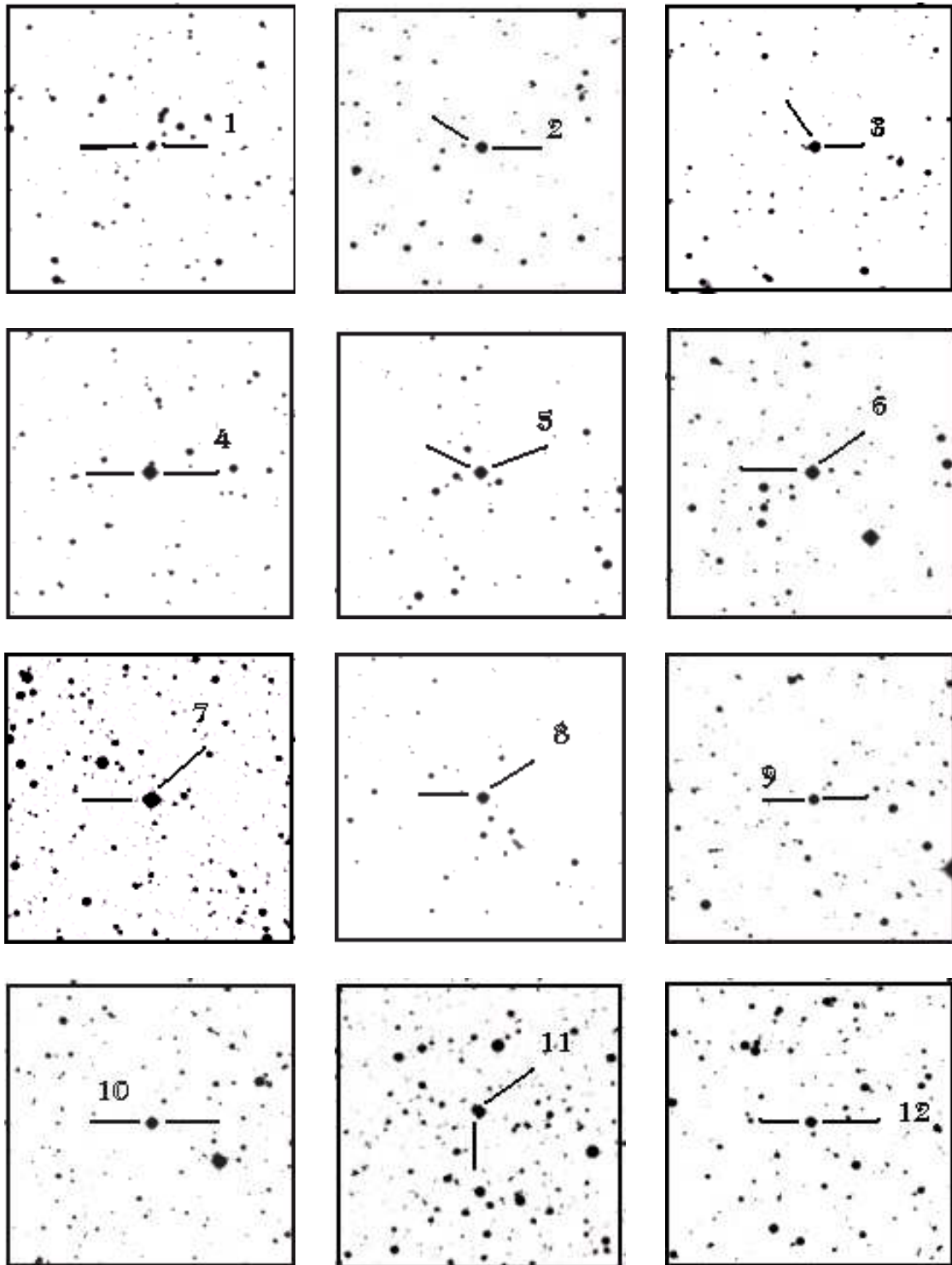
<sup>2</sup> Byurakan Astrophysical Observatory, Armenia, e-mail: nmelikia@helios.sci.am

During the spectral survey of M type stars in three dark cloud regions, 22 new red variables have been discovered.

The observations have been carried out with the 40" Schmidt telescope of the Byurakan Astrophysical Observatory using the 4° objective prism. As RG1 and RG2 filters and Kodak 103aF, IIaF and IIIaF photoemulsions have been used, the spectral region 6000–7000 Å has been recorded. The dispersion of the spectra is about 1100 Å/mm near H $\alpha$ . The limiting magnitude of the photographic plates in the red light is R=16.0, which gives the possibility to detect all M type stars brighter than R=15.0. The observations have been done over a period of 10 years: in 1979, 1985 and 1989.

The method of discovering M giants of late spectral classes is based on the availability of two absorption zones of TiO in the spectra of these stars near  $\lambda$ 6158 Å and  $\lambda$ 6651 Å. In this manner 96 new M type stars have been discovered in the total area of 48 deg<sup>2</sup> that was investigated (Melikian and Karapetian, 1997).

The comparison of the data for those 96 stars at different years allowed us to find 22 stars showing variability. The results for those 22 stars are presented in Table 1, which successively gives (1) the number of the star, (2) the number from the paper by Melikian and Karapetian (1997) (where the identification charts may be found), (3) the  $\alpha$  coordinate (1950.0) in units of hours, minutes and seconds, (4) the  $\delta$  coordinate (1950.0) in units of degrees, arcminutes and arcseconds (5-7) the B,V,R magnitudes measured by the method of King and Raff (1977), (8) the amplitude of the light variation in the red light and (9) the identification in the IRAS catalogue.



**Figure 1.** Identification charts of the new variables. The size of each chart is  $4'.2 \times 4'.2$ . North is up and east is to the left.

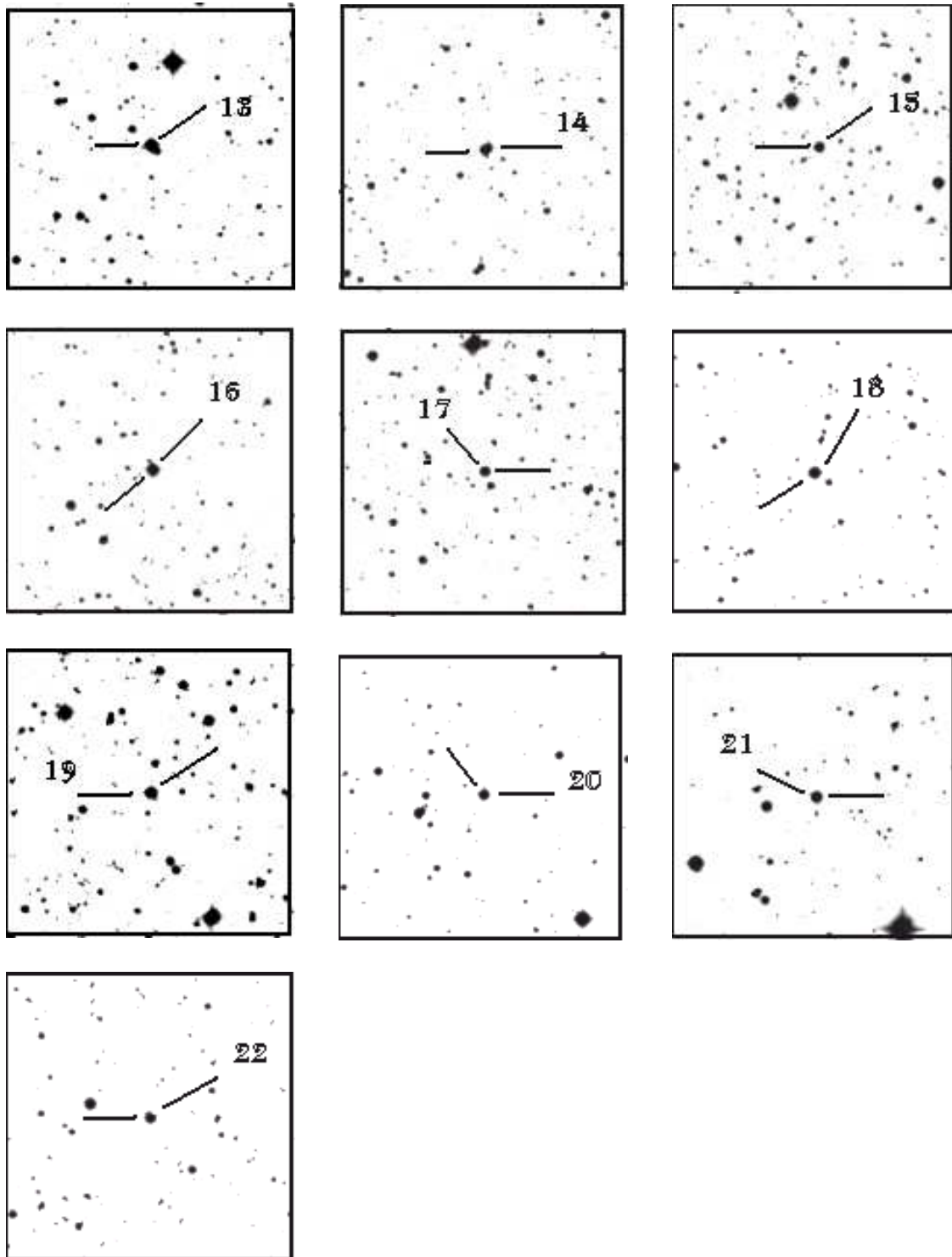


Figure 1. (cont.)

Table 1: New M variables in dark cloud regions

N	N*	$\alpha$			$\delta$			B	V	R	$\Delta R$	IRAS identifier
1	2	20	46	00.3	53	16	30	16.4	14.0	12.8	2.0	
2	7	20	48	23.7	53	41	33	16.7	14.1	12.8	0.7	IRAS 20483+5358
3	10	20	51	05.1	53	15	02	15.9	13.8	12.8	0.8	IRAS 20510+5314
4	11	20	51	18.8	52	51	06	15.4	13.4	12.4	0.9	IRAS 20513+5251
5	16	20	54	45.1	55	39	05	14.1	12.4	11.6	0.7	
6	22	20	56	20.6	54	55	34	13.4	12.4	11.9	0.7	IRAS 20563+5455
7	26	20	57	19.4	53	30	24	15.4	13.4	12.4	0.5	
8	29	20	57	43.8	55	30	58	16.7	15.0	14.2	1.0	IRAS 20577+5530
9	32	21	01	23.6	54	32	03	16.2	13.7	12.4	0.6	IRAS 21014+5432
10	41	21	07	47.1	54	43	58	13.8	11.6	10.5	0.6	
11	54	21	22	42.0	54	44	56	16.2	13.5	12.2	0.8	
12	55	21	23	02.9	55	57	39	16.2	13.7	12.5	1.2	
13	63	21	32	33.9	55	21	52	13.0	11.2	10.3	0.6	
14	72	21	34	59.7	53	57	59	16.2	13.5	12.2	0.6	IRAS 21349+5357
15	73	21	35	04.4	56	47	27	16.2	13.7	12.5	0.8	
16	78	21	37	51.5	56	03	36	14.0	12.6	11.9	0.7	IRAS 21378+5603
17	81	21	38	14.3	54	31	05	09.6	08.7	08.3	0.8	
18	83	21	40	28.9	54	44	19	16.2	13.5	12.2	0.5	
19	85	21	44	45.2	54	53	52	15.9	13.4	12.2	0.6	
20	91	23	27	17.5	64	34	55	15.4	13.3	12.2	0.8	
21	95	23	50	30.1	64	03	46	14.0	12.4	11.6	0.7	
22	96	23	51	01.3	63	32	08	15.4	13.3	12.2	0.6	

## References:

- Melikian N.D., Karapetian A.A., 1997, *Astrofizika*, in press.  
 King V.R., Raff M.I., 1977, *PASP* 89, No. 528, 120.