

THE NEW DOUBLE NUCLEI MARKARIAN GALAXIES

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ABSTRACT. In the course of morphological survey of Markarian galaxies on 2.6 m telescope of the Byurakan Observatory four new double nuclei objects were discovered. The results of morphological investigation of these galaxies are given and some parameters of the objects and their nuclei are estimated.

1. INTRODUCTION. THE OBSERVATIONS AND PROCESSING.

In the works of Petrosian et al (1978), Korowjakovskii et al (1981) the list of about 60 UV galaxies with double and multiple nuclei was given. The following observations have shown, that the nature of these nuclei can be highly different. Among them there are both nuclei with Seyfert characteristics (Petrosian et al, 1983; Petrosian, 1980) normal nuclei and HII nuclei (Petrosian et al, 1986; Petrosian 1981).

The list of four new Markarian galaxies with double nuclei structure, the results of their morphological investigation and some data about the galaxies and their nuclei are presented.

All observations are carried out in the prime focus of the Byurakan Observatory 2.6 telescope, on the blue plates Zu21 without filter. The scale on the plates is 21.4 "/mm. The plates were processed on the complex PDS 1010A+SM4 with the help of the programme for processing of the extended objects acting in the frame of computer system ADA of the Byurakan Observatory. Processing includes: the scanning of galaxies with 0"5 x 0"5 diagram; the surface photometry of the objects in B photometric system, in order to build isophotal maps in the units of stellar magnitudes per square seconds; the estimation of integral B magnitudes of galaxies and their nuclei and also the geometrical characteristics for these nuclei. Let us note ,

445

that the accuracy of the photometry in transition to the B system as $0.^m21 \pm 0.^m19$ was estimated.

2. THE LIST OF THE OBJECTS AND THEIR DESCRIPTION.

The data on the new double nuclei Markarian galaxies in Table 1 are collected.

T a b l e 1

	v_r^{gal}	Galaxies		Nuclei		The size of nuclei		The distances b/w nuclei		
		m_B	M_B	m_B	M_B	arc sec	kpc	arc sec	kpc	
M 162	6470	$14.^m5$	$-20.^m2$	N	$18.^m7$	$-16.^m0$	1.6	0.67	2.3	0.96
				S	$18.^m2$	$-16.^m5$	2.1	0.86		
427	6480	15.4	-19.3	N	19.5	-15.2	1.6	0.66	1.6	0.66
				S	19.4	-15.3	1.6	0.66		
802	4230	15.2	-18.6	N	18.7	-15.1	2.1	0.57	2.1	0.57
				S	18.7	-15.1	2.1	0.57		
1307	840	14.7	-15.7	N	19.0	-11.4	2.1	0.12	6.9	0.40
				S	18.1	-12.3	3.1	0.18		

In Table 1 individual nuclei as north (N) and south (S) are marked. $H = 75 \text{ km s}^{-1} \text{ Mpc}^{-1}$ is adopted. In Fig.1 the isophotal maps of the discovered galaxies are given. The steps of built isophotes in the left corner of each picture are given.

Descriptions of the galaxies according to 2.6 m telescope plates are given below.

Markarian 162 - Spiral galaxy with sharp arms. On the extension of curved north arm a formation reminding of giant HII region is observed. A tail of low surface brightness is extended to the diffuse object which is $57''$ ($\sim 24 \text{ kpc}$) to the north from the galaxy. The galaxy is a powerful source of FIR radiation ($2 \cdot 10^{16} L_{\odot}$, Longdale et al, 1985).

Markarian 427. According to Markarian and Lipovetskii (1972) it is a close pair of spheroidal galaxies. Since both central condensations have about the same brightness and sizes are situated at the distance of about 700 pc only from each other and are surrounded by a symmetrical inner envelope, it is possible to consider them as nuclei of one galaxy (Korowjakovskii et al, 1981). The galaxy interacts with the neighbour of 17.3 magnitude.

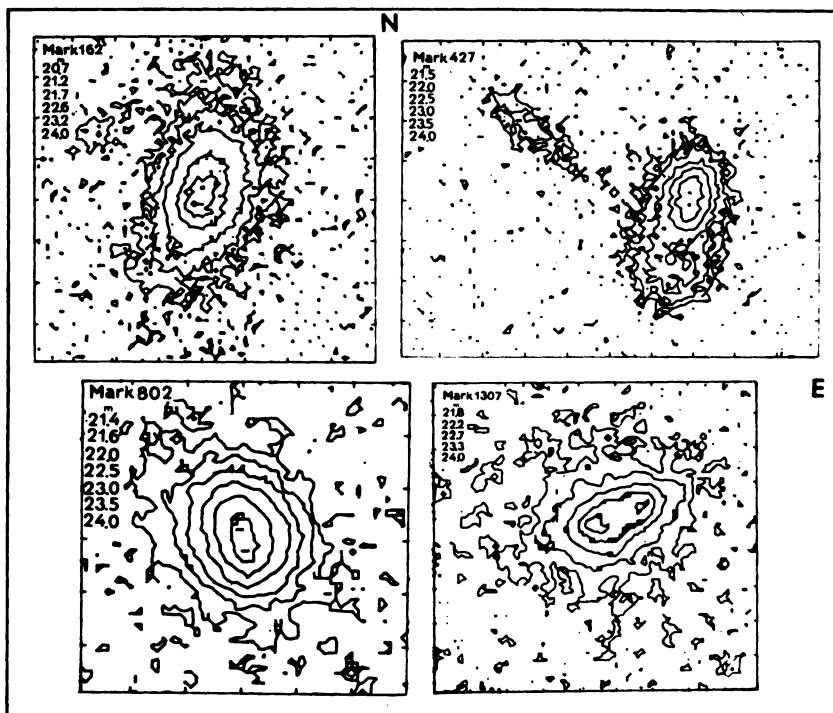


Fig.1 B isophotes of the double nuclei galaxies.
Each division on the pictures is equal to
5 arcsec.

Markarian 802. According to inner symmetric isophotes it is a classical spheroidal galaxy. Outer isophotes are asymmetric in the south-east and north-west directions.

Markarian 1307. According to Markarian et al (1973) it is a close double in a common envelope. The regular form of the outer isophotes of the galaxy, comparable brightness of central condensations and their symmetrical situation toward the geometrical centre of the galaxy allow us to consider these condensations as nuclei (Korowjakovskii et al, 1981). Very likely these nuclei have characteristics of similar condensations in Mrk 116 = IZw18 (Petrosian et al, 1978; Kunth and Sargent, 1986).

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