академия наук армянской сср АСТРОФИЗИКА

TOM 12

НОЯБРЬ, 1976

выпуск 4

THE RADIO EMISSION OF NGC 5363

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It is shown that the radio source in the galaxy NGC 5363 is coincident with the optical nucleus of galaxy and consists of a compact core with diameter less than 2 are see, and probably an extended component with a size of about 20 are see. The location of the radio source in NGC 5363 and its radio spectrum favour the suggestion that an explosion similar to that in M82 has taken place in this galaxy.

NGC 5363 is an irregular galaxy included by Markarian [1] in the group of galaxies, with morphology, spectra and colors similar to that of M 82, a galaxy well known for the explosion in its nucleus [2]. A detailed spectrophotometric and photometric study of a number of irregular galaxies carried out by Chromey [3]. Shapovalova [4, 5] and Krienke and Hodge [6] suggests that these type Irr II galaxies do not all belong to a single class; however, according to Shapovalova [5]. NGC 5363 is among the few explosive galaxies of M 82 type. According to Krienke and Hodge [6] NGC 5363 is a dusty galaxy, probably of S0 type.

We present in this paper the results of radio interferometric observations of the radio source in NGC 5363 first detected by Tovmassian [7] at 1410 *MHz*. Our observations permitted us to measure with high precision the position of the radio source in NCC 5363.

The observations were made in 1972 with the Green Bank radio interferometer at frequencies of 2695 and 8085 MHz. The observing procedures are described by Sramek and Tovmassian [8]. Components down to 2 arc sec were resolved by the baselines used and components larger than 3 arc min would not be seen.

Observations at 2695 MHz show that the radio source in NGC 5363 consists of a compact core and a very weak extended component. 9-962

The flux densities of the core and of the extended component are 114 m/y and 18 m/y respectively. The total flux measured with a 100 m spacing is 136 m/y. The diameter of the core, from the 8.1 GHz data, is less than 2 arc sec.

The diameter of the extended component, from the 2.7 GHz data, is very roughly about 30 *arc* sec, but its structure is not well determined. The large component is buried in noise at 8085 MHz, and the flux density of the core at this frequency is 68 mJy.

The coordinates of the core determined with an accuracy better than 1 arc sec are: RA 13.53.50.46, Dec = 05.29'56' (1950). The location of the radio source in NGC 5363 was determined by superposition of the map marked with the position of the radio core and of the nearby 9 weak stars on a photograph of the galaxy.

Accurate coordinates of these stars were measured with the Ascorecord relative to the catalogued positions of 12 brighter stars. One of the weak stars is projected on the galaxy image and is situated at a distance of only about 6 arc sec from its optical centre. The superposition showed that the radio core is located in the very optical nucleus of the galaxy (see Plate 1).

Thus the results show that the nucleus of NGC 5363 is in an active stage and are in favour of the suggestion made by Tovmassian [9] that an explosion similar to the one in M82 has probably taken place in this galaxy as well.

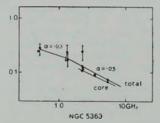


Fig. 1. Radio spectra of the radio source in NGC 5363.

The radio spectrum of NGC 5363 is shown in Figure 1, using the present observations at 2695 and 8085 MHz and previous measurements by Whiteoak [10] at 5000 MHz, by Wright [11] at 2700 MHz, by Tov-massian [7] at 1400 and 2650 MHz, by Pfleider at 1400 MHz, by Tov-massian and Terzian [12] at 430 MHz and by Cameron [13] at 408 MHz.

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Plate 1. The NGC 5363 and the position of the radiu source in it, noted by +.

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If a two component spectrum is desired, the spectral index is about -0.3 between 408 *MHz* and 1400 *MHz*, and becomes somewhat steeper at higher frequencies, where the spectral index is about -0.5. The data may also be fit by a single power law spectrum of z = 0.4. The inspection of Fig. 1 shows also that the flux at 2650 *MHz* measured by Tovmassian [7] in 1965 is most likely overestimated as in the case of NGC 520 [14].

The authors acknowledge Dr. E. Ye. Khachikinn for permission to use the photograph of NGC 5363 obtained by him on the 4 m telescope at Kitt-Peak. They also express their gratitude to E. Ts. Shahbazian for measurements of the positions of stars in the vicinity of NCC 5363 and to Dr. Pfleiderer for making available to us the results of his radio observations of galaxies prior to publication.

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РАДИОИЗАУЧЕНИЕ ОТ NGC 5363

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Показано, что радиоисточник в галактике типа М 82, NGC 5363, расположен в оптическом ядре галактики в состоит из компактного ядра с диамстром менее 2° и, возможно, протяженного источника с размером около 20°. Расположение радиоисточника в NGC 5363 и его радиоснектр подтверждают предположение о том, что вырыв, анало; ичный в М 82, возможно, имел место и в этой галактике.

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* Operate 1 by Council University under contrast with the National Science Foundation.

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