1990RMxAA..21..511A

Rev. Mexicana Astron. Astrof., 21, 511-513 (1990)

RADIO MAP OF THE REGION G331.5-0.1 AT 22 GHz

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RESUMEN. Se hicieron relevamientos en 22 GHz en la región térmica G331.5-0.1 con el radiotelescopio de Itapetinga, el cual tiene una resolución de 4.6 minarc en esta frecuencia. La región incluye también las fuentes de radio G331.5-0.1, G331.4-0.0, G331.3-0.2, G331.3-0.3, G331.0-0.1, G331.1-0.5, G330.9-0.4 y G330.7-0.4, conocidas en 5 GHZ.

ABSTRACT. The thermal region G331.5-0.1 was mapped at 22 GHz with the Itapetinga radiotelescope, which has a resolution of 4.6 arcmin at this frequency. The region includes also the radio sources G331.5-0.1, G331.4-0.0, G331.3-0.2, G331.3-0.3, G331.0-0.1, G331.1-0.5, G330.9-0.4, and G330.7-0.4, known at 5 GHz.

Key words: RADIO SOURCES-GENERAL

. INTRODUCTION

We present a 22 GHz radio map of the regions of the galactic plane centered in $6^h7^m30^s$ of right ascention and $-51^o39'24''$ of declination. This region is located in the irection of the Norma spiral arm and presents 8 sources, the most intense, G331.5-0.1 gives he name to it. Maps at 5 GHz with 4' resolution and at 408 MHz with a 3' resolution are vailable (Haynes et al. 1978, Goss e Shaver 1970). Recombination lines and strong H_2O maser mission are also characteristic of some of the sources in this region.

I. OBSERVATIONS

The observations were made with the 13.7 m Itapetinga radiotelescope at the requency of 22 GHz. The receiver was a K-band mixer with a d.s.b. of 1 GHz. The receiver was perated in the total power mode, the system temperature was around 700 K and the integration ime 50ms. The observations consisted of scans in right ascention (RA) with an amplitude of °, separated in declination by 2'. During each observation there were made 30 scans of 20 s uration, precceded by calibrations with a noise source of known temperature and a load at room emperature. Before each observing period, measurements of Virgo A were made, in the form of cans in azimute and elevation, to determine the antenna efficiency and verify the pointing ccuracy.

II. RESULTS

In Fig. 1 we present the 22 GHz map of the G331.5-0.1 region with 4!6 resolution. he numbers (N) associated with each contour line are related to the antenna temperature T_A y $T_A = 0.359$ (N/100). The relationship between antenna temperature and flux density (S_p) or a point source was obtained from the observations of Virgo A, which has a flux density of 1.5 Jy at 22 GHz (Janssen et al. 1974). We found the relation $S_p(Jy) = 63.2 \times T_A$ (k).

We corrected the antenna temperature for the effects of atmospheric absorption, sing the calibration method described by Abraham (1986).

The physical parameters of the sources detected in the map are presented in able 1. Columns 1, 2 and 3 correspond to the name and coordinates (1950) of the sources, olumns 4 to 8 represent respectively, the peak antenna temperature. peak flux density, ngular size, integrated flux density and spectral index between 5 and 22 GHz. The thermal T) or non-thermal (NT) nature of the sources is indicated in column 9. The magnitude of

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the spectral index was calculated using the 5 GHz data of Caswell et al. (1987). The detection of the hydrogen recombination lines H109α and H110α by these authors and the determination of their physical parameters confirm the thermal nature of the sources. Due to its low intensity we were not able to determine the size of the source G330.7-0.4.

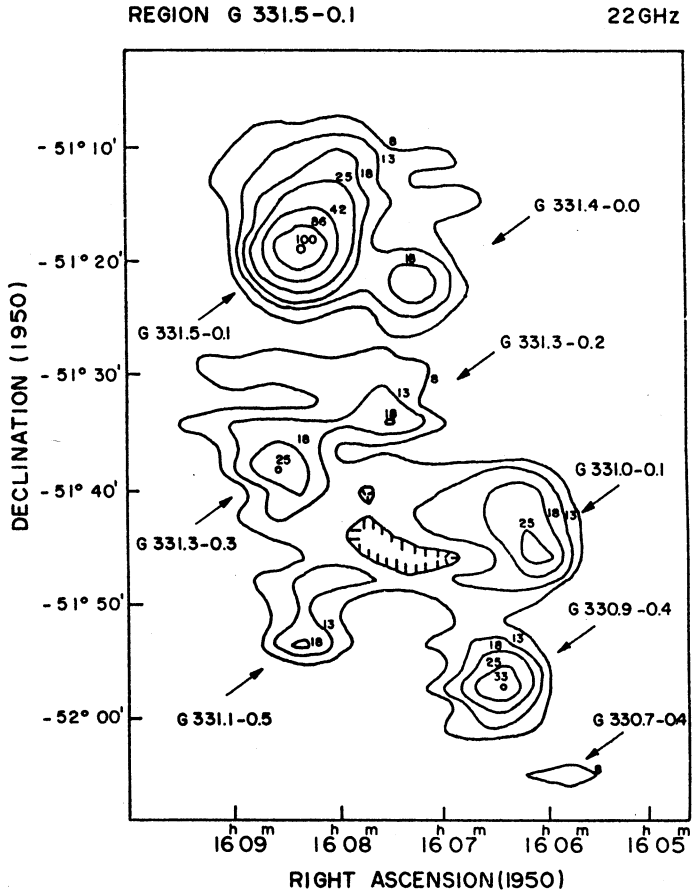

Figure 1 - Radio map of the region G331.5-0.1 at 22 GHz

TABLE 1

FONTE	A.R. (1950) h m s	DEC (1950) o " '	T_A (K)	S_p (Jy)	θ (')	S_I (Jy)	α	NAT
G331.5-0.1	16 08 21.6	-51 19 24	0.359	22.7	3.2	33.5	0.11	T
G331.4-0.0	16 07 17.2	-51 23 24	0.084	5.3	3.1	7.7	0.17	T
G331.3-0.3	16 08 34.5	-51 39 24	0.090	5.7	2.5	7.4	0.03	T
G331.3-0.2	16 07 36.2	-51 35 24	0.067	4.2	2.2	5.1	0.12	T
G331.0-0.1	16 06 12.4	-51 47 24	0.095	6.0	7.5	21.7	0.13	T
G331.1-0.5	16 08 21.9	-51 55 24	0.070	4.4	2.1	5.4	-0.21	T
G330.9-0.4	16 06 25.1	-51 59 24	0.114	7.2	2.7	9.7	0.06	T
G330.7-0.4	16 05 45.8	-52 07 24	0.038	2.4	---	---	---	-

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ACKNOWLEDGEMENTS

We acknowledge the financial support of the Brazilian agencies FAPESP and CNPq.

REFERENCES

Abraham, Z.; Botti, L.C.L.; del Ciampo, L.F., 1986, Rev. Mexicana Astron. e Astrof. 12, 414
Caswell, J.L.; Haynes, R.F., 1987, Astron. Astrophys. 171, 261
Haynes, R.F.; Caswell, J.L.; Simons, L.W., 1978, Aust. J. Phys. Astrophys. Suppl. no. 45, 1
Janssen, M.A.; Golden, L.M.; Welch, W.J., 1974, Astron. Astrophys. 33, 373
Shaver, P.A.; Goss, W.M., 1970, Aust. J. Phys. Astrophys. Suppl. 14, 1-133

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