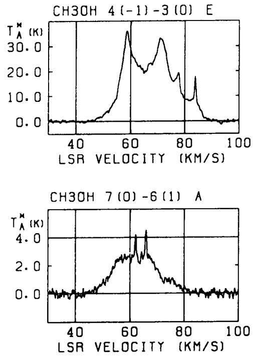


Fig. 2. Examples of maser emission profiles of 4_1-3_0E and 7_0-6_1A$^+$ lines of CH_3OH.

The fractional abundance of methanol to molecular hydrogen (CH_3OH/H_2) required to cause maser action is estimated to be $\sim 10^{-7}$. Such a high abundance may be provided by evaporation from dust surfaces.

THE Sgr B2 REGION SEEN AT 43 GHz

Hisashi Hirabayashi, Kenji Akabane, Masaki Morimoto,
Yosiaki Sofue, Makato Inoue
Nobeyama Radio Observatory, Nobeyama, Nagano, Japan
Toshihiro Handa
Department of Astronomy, University of Tokyo, Tokyo, Japan

The Sgr B2 region was mapped at 43 GHz (λ = 6.9 mm) with the 45m radio telescope of Nobeyama Radio Observatory. The observing parameters were: a) half power beamwidth 38", b) pointing accuracy better than 10", c) central frequency 43.0 GHz, d) bandwidth 500 MHz, and e) system noise temperature 400 K; and the observational aspects were: a) mapping with one polarization, b) liquid-nitrogen cooled load switching and c) reduction by NOD-2 programme.The obtained map is shown in Figure 1. Sgr B2 is resolved into several components which correspond to those by Martin and Downes (1972) and Downes *et al.* (1978). But the component at RA = $17^h44^m11.8^s$ Dec. = -28°23'55" at 1950 is not seen in Martin and Downes (1972) nor in the 5 GHz map of Downes *et al.* (1978), although the feature is seen in the 10.7 GHz map of Downes *et al.* (1978). The components derived from the map in Figure 1 by a morphological estimate are listed in Table 1. The total flux density of the region is 146J±30 Jy. The intensity calibration was made by observing NGC 7027.

A comparison was made with the 10.7 GHz results by Downes *et al.* (1978) obtained with the Bonn 100-m radiotelescope. As the spatial rerolution of the 10.7 GHz results is 1.3', the 43 GHz map was convolved

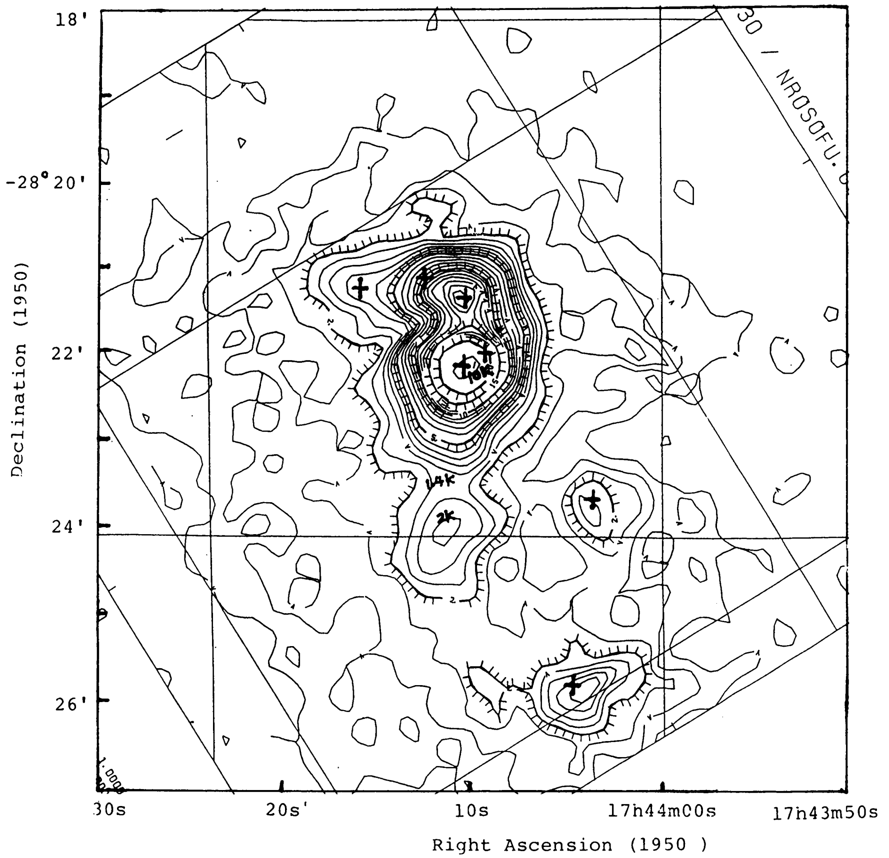


Fig. 1. 43 GHz continuum map of the Sgr B2 region with a 38" resolution. The components MD1 through MD7 are shown by + marks from right to left in the map.

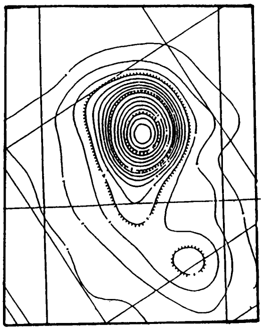
to give the same resolution (1.3'), then the maps with the same resolution were compared (see Figure 2). The spectrum over the region as a first approximation is thermal. But a detailed inspection of the maps shows a non-thermal tendency in an area located south of the strong sources MD4 and MD5, also the 43 GHz emission in the northern region is slightly stronger than expected for a thermal spectrum, and the 43 GHz emission is more intense in the northern region. The above deviations amount to about 5% of the peak intensity of MD5. A dust emission component in the northern area at 43 GHz may be present. For that reason, the 1-mm result by Westbrook *et al.* (1976) obtained with the 5 m optical telescope of the Hale Observatory was examined. But to be more specific, the intensity calibration and the baselevel must be examined carefully.

The Sgr B2 region was observed in the H 51α recombination line by Morimoto *et al.* (1985) and an estimation of the electron temperature in

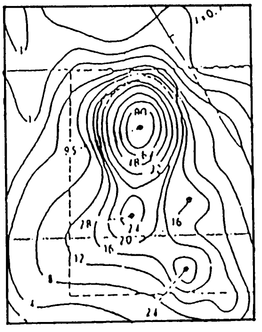
Table 1. Components in the Sgr B2 Region

No.	Source	Peak Position (1950) RA	Dec.	Source Size (arcsec)	Flux (Jy)
1	MD1	$17^h47^m3.5^s$	-28°23'45"	unresolved	1.7 ± 0.3
2	MD2	17 44 4.5	-28 25 50	unresolved	4.9 ± 1
3		17 44 10	-28 22 30	240" × 300"	89 ± 20
4	MD5	17 44 10.5	-28 22 10	44 × 31	32.7 ± 5
5	MD4+MD5	17 44 10.5	-28 22 00	22 × 63	47.5 ± 5
6	MD4	17 44 10.6	-28 21 10	18 × 16	12.9 ± 3
7	G0.64-0.06	17 44 11.8	-28 23 55	46 × 50	5.3 ± 1

the region can be given by assuming local thermodynamic equilibrium. The observed frequency and the telescope half power beamwidth are 36 GHz and 46", respectively. The results will be presented elsewhere.



43GHz 1.3'
Nobeyama
(convolved)



10.7GHz 1.3'
Bonn

Fig. 2. Continuum maps of the Sgr B2 core region at 43 GHz (left; convolved to a 1.3' resolution) and at 10.7 GHz (right; reproduced from Downes *et al.* 1978).

REFERENCES

Downes, D., Goss, W., Schwartz, U., and Wouterloot, J. 1978: Astron. and Astrophys. Suppl. 35, 1.
Martin, A., and Downes, D. 1972: Astrophys. Letters 11, 219.
Morimoto, M., Oishi, M., and Kanzawa, T. 1985: Astrophys. J. 288, L11.
Westbrook, W., Werner, M., Elias, J., Gezari, D., Hauser, M., Lo, K., and Neugebauer, G. 1976: Astrophys. J. 209, 94.