

## A line survey of the massive star-forming region Sgr B2(M) in the 3 and 7 mm regions

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Line survey is an intensive investigation of chemical composition of a molecular cloud. The galactic center region is still primitive for detail chemical composition. In the present study, we carried out line survey of the massive star-forming region Sgr B2(M) in the 3 and 7 mm regions with Nobeyama 45 m radio telescope. Especially the 7 mm region was firstly surveyed in this cloud. Fig. 1 shows the observed peaks in the 3 and 7 mm regions. The  $J = 7_{16}-6_{15}$  and  $7_{25}-6_{24}$  transitions of  $\text{HCOOCH}_3$  were observed for the first time in Sgr B2(M). The column density was determined to be  $9.3 \times 10^{13} \text{ cm}^{-2}$ , where the rotational temperature was fixed at 23 K reported by Cummins *et al* [1]. The lines of the  $J = 6-5$  transition for  $\text{CH}_3\text{CCH}$  were also observed. The column density and the rotational temperature were determined to be  $1.1 \times 10^{16} \text{ cm}^{-2}$  and 38 K, respectively. In addition, the lines of  $\text{CH}_3^{13}\text{CCH}$  were observed for the first time as an interstellar molecule. In the 7 mm region, the absorption lines of the  $J = 1-0$  transition were observed for  $^{28}\text{SiO}$  and  $^{29}\text{SiO}$ . Although both the components of the envelop of Sgr B2(M) and the clouds in front of it were found for  $^{28}\text{SiO}$ , the former was only detected for  $^{29}\text{SiO}$ . This difference is thought to be due to a higher  $^{29}\text{Si}/^{28}\text{Si}$  ratio in Sgr B2(M).

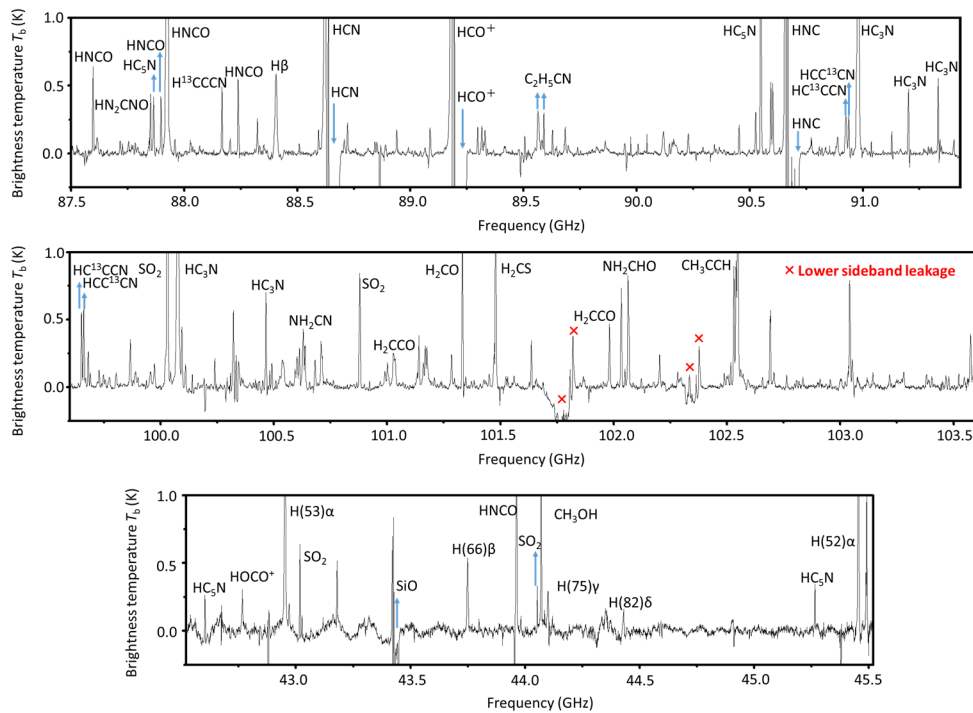


Fig. 1: The observed peaks in the 3 mm and 7 mm regions with Nobeyama radio telescope. Upper panel: 87.5~91.5 GHz. Middle panel: 99.6~103.6 GHz. Lower panel: 42.5~45.5 GHz.

**Reference:** [1] S. E. Cummins *et al.*, *ApJS*, **60**, 819 (1986).