

OBSERVATIONS OF THE $J=6$ TO 5 LINE OF OCS IN SGR B2

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Abstract. The $J=6$ to 5 line of OCS at 72.9768 GHz was detected in Sgr B2 with antenna temperature 0.3 K, velocity +62 km s⁻¹, and velocity half width of ~25 km s⁻¹.

The $J=6$ to 5 line of OCS (72.9768 GHz) was detected in Sgr B2 with an antenna temperature of 0.3 K, centered at +62 km s⁻¹ with a half width of about 25 km s⁻¹. This is the first detection of this line in celestial sources. The line strength gives a column density of OCS molecules around 10¹⁵ cm⁻², similar to that given by Jefferts *et al.* (1971) from their observations of the $J=9$ to 8 line, and the peak velocity also agrees well. However, our observations give twice as large a line width as given by

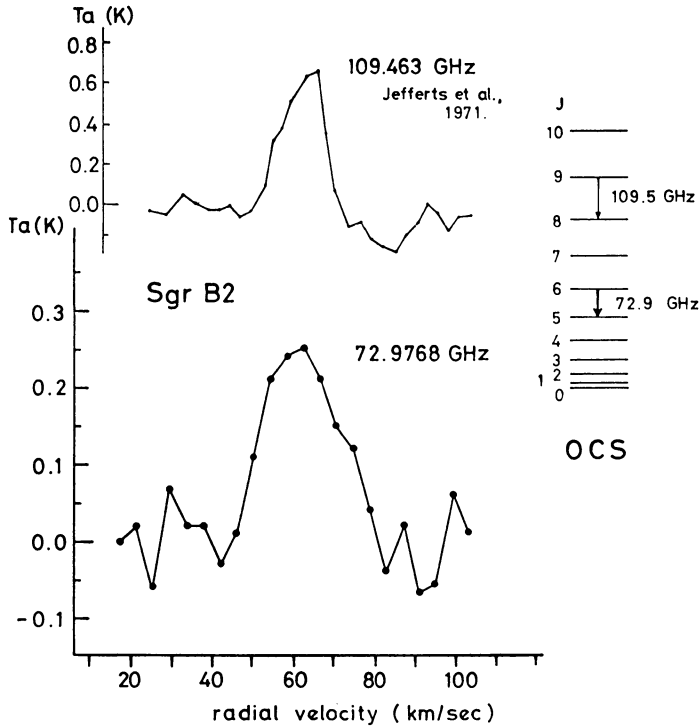


Fig. 1. Profiles of $J=9$ to 8 (from Jefferts *et al.*, 1971) and $J=6$ to 5 lines of OCS. Ordinates denote the line of sight velocity, and the abscissa the antenna temperatures.

Jefferts *et al.*, which may be due to the large beamwidth of our observations. A large beam tends to pick up emission from the outer part of the source where the velocity can be different from the inner part, giving rise to a larger line width.

In this search we detected $1_{01}-0_{00}$ line of para-formaldehyde in Ori A and Sgr B2 but failed to detect the OCS line in Ori A, to a limit of 0.2 K peak to peak. Results of a search for other lines are summarized in Table I.

TABLE I
Negative results

Molecule	Frequency (GHz)	Object	Peak-to-peak noise (K)	τ (h)
H ₂ CO $1_{01} \rightarrow 0_{00}$	72.8381	IRC + 10216	0.4	7.0
		W51	0.4	8.2
		Heiles cloud 2	0.5	
		Heiles cloud 4	0.5	
OCS $6 \rightarrow 5$	72.9768	Ori A	0.2	15.3
		IRC + 10216	0.4	7.0
		W51	0.4	8.2
HCCCN $8 \rightarrow 7$	72.7851	W51	0.3	4.2
SO ₂ $6_{06} \rightarrow 5_{15}$	72.7583	IRC + 10216	0.4	1.8

A fuller account of this work will be published in the *Publications of the Astronomical Society of Japan*.

Reference

Jefferts, K. B., Penzias, A. A., Wilson, R. W., and Solomon, P. M.: 1971, *Astrophys. J. Letters* **168**, L111.

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