Appendix A: Physical conditions and chemical abundances in TMC 1

Table A.1: TMC 1 physical conditions and chemical abundances

Source name	T_{dust} (K)	A_v (mag)	T_{gas}(K)	n_H (cm^{-3})	N(^{13}CS) (cm^{-2}) [a]	N(^{13}CS) / N(H_T) [c]	N(ortho − H_2S)(cm^{-2})	N(H_2S) / N(H_T)
TMC 1-CP+0	11.92	18.20	9.7 ± 0.8	$(3.0 \pm 0.8) \cdot 10^4$	$(3.9 \pm 1.0) \cdot 10^{12}$	$(1.1 \pm 0.3) \cdot 10^{-10}$	$(3.1 \pm 0.9) \cdot 10^{13}$	$(1.1 \pm 0.3) \cdot 10^{-9}$
TMC 1-CP+30	12.00	16.71	10.2 ± 0.2	$(4.6 \pm 0.4) \cdot 10^4$	$(1.6 \pm 0.2) \cdot 10^{12}$	$(4.7 \pm 0.6) \cdot 10^{-11}$	$(5.1 \pm 1.4) \cdot 10^{13}$	$(2.0 \pm 0.6) \cdot 10^{-9}$
TMC 1-CP+60	12.24	13.74	11.3 ± 2.2	$(7.6 \pm 3.8) \cdot 10^4$	$(1.2 \pm 0.4) \cdot 10^{11}$	$(4.3 \pm 1.4) \cdot 10^{-11}$	$(1.2 \pm 0.6) \cdot 10^{13}$	$(5.7 \pm 0.3) \cdot 10^{-10}$
TMC 1-CP+120	13.16	7.27	12.5 ± 1.3	$(3.0 \pm 0.8) \cdot 10^3$	$(2.8 \pm 1.1) \cdot 10^{12}$	$(1.9 \pm 0.8) \cdot 10^{-10}$	$(5.5 \pm 1.6) \cdot 10^{13}$	$(5.1 \pm 1.4) \cdot 10^{-9}$
TMC 1-CP+180	13.86	4.77	16.0 ± 2.6	$(5.4 \pm 1.6) \cdot 10^3$	$(5.4 \pm 1.5) \cdot 10^{12}$	$(5.7 \pm 1.6) \cdot 10^{-11}$	$(4.3 \pm 1.3) \cdot 10^{13}$	$(5.9 \pm 1.8) \cdot 10^{-9}$
TMC 1-CP+240	14.39	3.25	14.7 ± 1.1	$(3.2 \pm 2.0) \cdot 10^3$	$(5.2 \pm 3.2) \cdot 10^{11}$	$(8.0 \pm 5.0) \cdot 10^{-12}$	$(2.1 \pm 1.3) \cdot 10^{13}$	$(4.2 \pm 2.1) \cdot 10^{-9}$ [b]
TMC 1-C+0	11.26	19.85	8.5 ± 2.0	$(9.2 \pm 6.8) \cdot 10^4$	$(1.1 \pm 0.5) \cdot 10^{12}$	$(2.8 \pm 1.2) \cdot 10^{-11}$	$(2.0 \pm 1.5) \cdot 10^{13}$	$(6.0 \pm 4.9) \cdot 10^{-10}$
TMC 1-C+30	11.32	18.47	10.3 ± 2.0	$(8.8 \pm 4.6) \cdot 10^4$	$(7.0 \pm 3.9) \cdot 10^{11}$	$(1.9 \pm 1.1) \cdot 10^{-11}$	$(2.5 \pm 1.3) \cdot 10^{13}$	$(8.6 \pm 5.0) \cdot 10^{-10}$
TMC 1-C+60	11.67	13.34	11.6 ± 2.2	$(2.4 \pm 1.0) \cdot 10^4$	$(9.2 \pm 2.3) \cdot 10^{11}$	$(3.5 \pm 0.9) \cdot 10^{-11}$	$(5.4 \pm 2.0) \cdot 10^{13}$	$(2.6 \pm 1.0) \cdot 10^{-9}$
TMC 1-C+120	13.13	4.79	11.1 ± 1.9	$(1.1 \pm 0.5) \cdot 10^4$	$(6.2 \pm 1.8) \cdot 10^{11}$	$(6.5 \pm 1.9) \cdot 10^{-11}$	$(1.0 \pm 0.5) \cdot 10^{13}$	$(1.4 \pm 0.6) \cdot 10^{-8}$
TMC 1-C+180	14.08	2.20	13.5 ± 1.1	$(1.1 \pm 2.8) \cdot 10^4$	$(1.8 \pm 0.9) \cdot 10^{11}$	$(4.1 \pm 2.1) \cdot 10^{-11}$	$(6.5 \pm 3.3) \cdot 10^{12}$ [b]	$(1.9 \pm 1.0) \cdot 10^{-9}$ [b]
TMC 1-C+240	14.53	1.63	13.5 ± 2.7	$(5.2 \pm 1.8) \cdot 10^3$	$(1.6 \pm 1.0) \cdot 10^{11}$	$(4.9 \pm 3.0) \cdot 10^{-11}$	$(1.5 \pm 1.0) \cdot 10^{13}$ [b]	$(6.0 \pm 4.2) \cdot 10^{-9}$ [b]

Notes:
[a] When ^{13}CS or $C^{34}S$ isotopologues are not detected, ^{13}CS column densities are determined from that of $C^{34}S$ or CS, applying the ratios CS/^{13}CS ≈ 60 and $C^{34}S$/^{13}CS ≈ 8/3.
[b] Upper bound values.
[c] N(H_T) stands for the total hydrogen column density: N(H_T) = N(H) + 2 N(H_2).

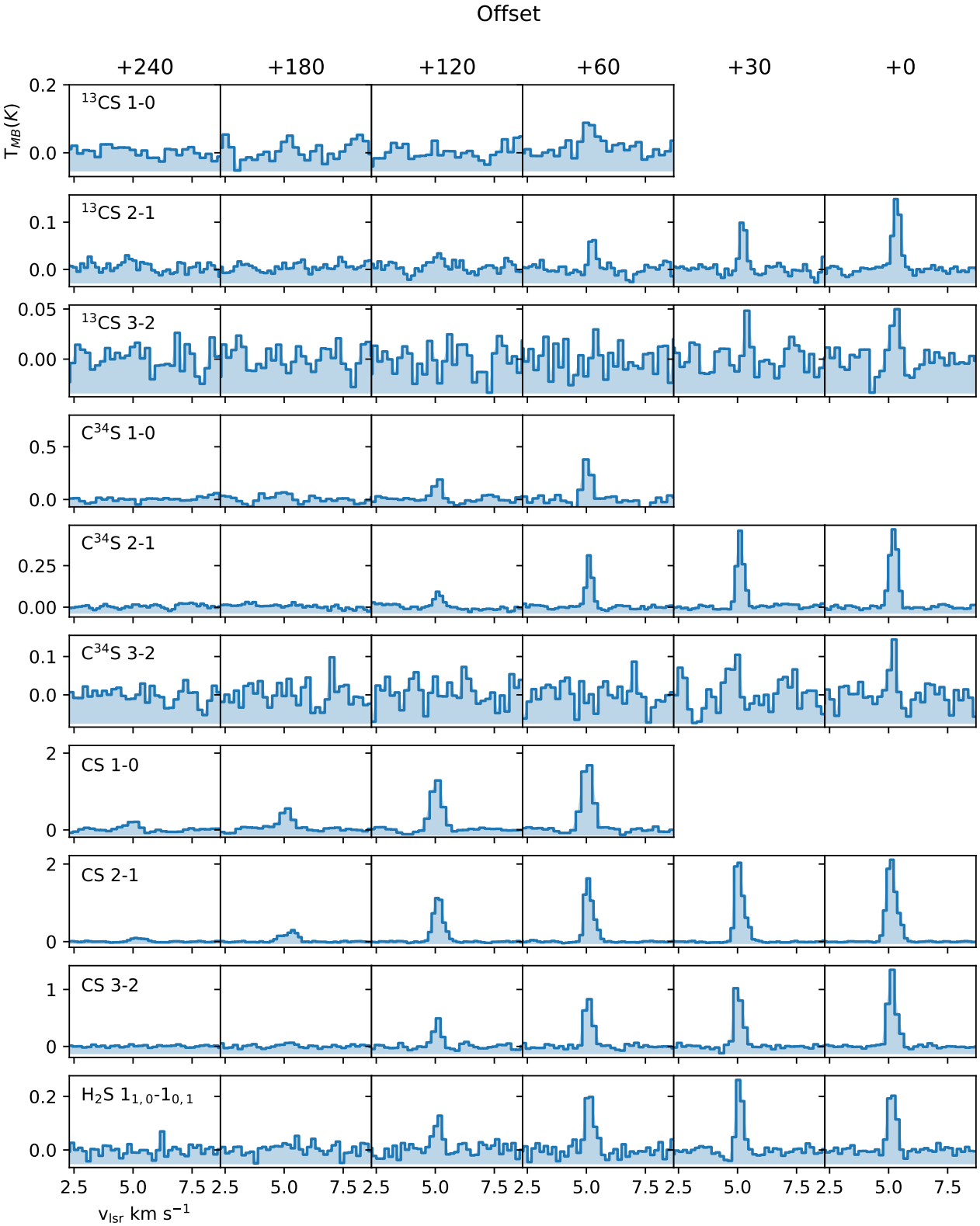

Fig. A.1: Single dish spectra of ^{13}CS 1 → 0, ^{13}CS 2 → 1, ^{13}CS 3 → 2, C^{34}S 1 → 0, C^{34}S 2 → 1, C^{34}S 3 → 2, CS 1 → 0, CS 2 → 1, C^{34}S 3 → 2 transitions towards TMC 1-C positions with offsets (+0”, 0”), (+30”, 0”), (+60”, 0”), (+120”, 0”), (+180”, 0”), (+240”, 0”). The systemic velocity is v_{lsr} = 6.5 km s^{-1}.

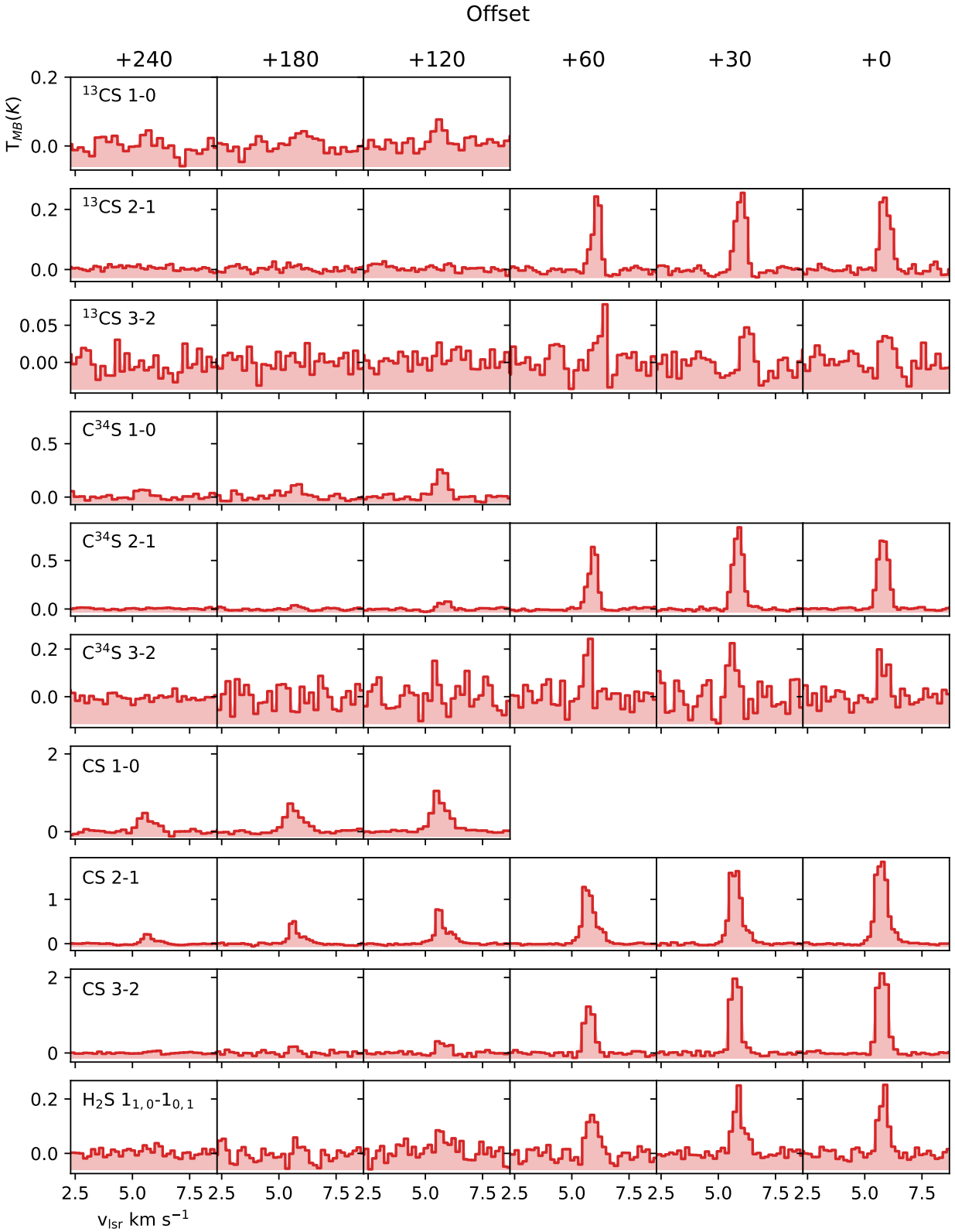

Fig. A.2: Single dish spectra of ^{13}CS 1 → 0, ^{13}CS 2 → 1, ^{13}CS 3 → 2, C^{34}S 1 → 0, C^{34}S 2 → 1, C^{34}S 3 → 2, CS 1 → 0, CS 2 → 1, C^{34}S 3 → 2 transitions towards TMC 1-CP positions with offsets (+0”, 0”), (+30”, 0”), (+60”, 0”), (+120”, 0”), (+180”, 0”), (+240”, 0”). The systemic velocity is v_{lsr} = 6.5 km s^{-1}.

Appendix B: Physical conditions and chemical abundances in Barnard 1b

Table B.1: Barnard 1b physical conditions. ^{13}CS and H_2S abundances.

Source name	T_{dust} (K)	A_v (mag)	T_{gas}(K)	n_H (cm^{-3})	N(^{13}CS) (cm^{-2}) [a]	N(^{13}CS) / N(H_T)	N(ortho − H_2S)(cm^{-2})	N(H_2S) / N(H_T)
B1B-cal-0_0	11.90	76.00	9.8 ± 1.4	$(6.3 \pm 3.0) \cdot 10^5$	$(2.0 \pm 1.6) \cdot 10^{12}$	$(2.6 \pm 2.1) \cdot 10^{-11}$	$(5.2 \pm 2.5) \cdot 10^{13}$	$(4.5 \pm 2.1) \cdot 10^{-10}$
B1B-cal-10_0	11.72	59.80	10.1 ± 1.5	$(4.2 \pm 2.8) \cdot 10^5$	$(1.3 \pm 0.9) \cdot 10^{12}$	$(2.2 \pm 1.5) \cdot 10^{-11}$	$(1.8 \pm 1.2) \cdot 10^{14}$ [c]	$(1.9 \pm 1.2) \cdot 10^{-9}$ [c]
B1B-cal-20_0	11.72	45.80	10.9 ± 1.7	$(1.6 \pm 0.9) \cdot 10^5$	$(1.9 \pm 1.2) \cdot 10^{12}$	$(4.0 \pm 2.6) \cdot 10^{-11}$	$(3.2 \pm 2.1) \cdot 10^{14}$ [c]	$(4.5 \pm 2.9) \cdot 10^{-9}$ [c]
B1B-cal-30_0	11.54	38.70	11.9 ± 1.0	$(1.0 \pm 0.4) \cdot 10^5$	$(1.1 \pm 0.5) \cdot 10^{12}$	$(2.8 \pm 1.2) \cdot 10^{-11}$	$(3.1 \pm 1.4) \cdot 10^{14}$	$(5.2 \pm 2.3) \cdot 10^{-9}$
B1B-cal-40_0	11.54	28.39	12.1 ± 1.1	$(1.0 \pm 0.4) \cdot 10^5$	$(9.5 \pm 4.4) \cdot 10^{11}$	$(3.3 \pm 1.6) \cdot 10^{-11}$	$(2.0 \pm 0.9) \cdot 10^{13}$	$(4.5 \pm 2.0) \cdot 10^{-9}$
B1B-cal-50_0	12.39	20.00	13.2 ± 1.3	$(4.7 \pm 2.2) \cdot 10^4$	$(1.7 \pm 0.8) \cdot 10^{11}$	$(8.7 \pm 4.2) \cdot 10^{-11}$	$(1.9 \pm 0.9) \cdot 10^{13}$	$(6.0 \pm 2.9) \cdot 10^{-9}$
B1B-cal-60_0	12.67	20.00	12.3 ± 0.9	$(3.1 \pm 1.6) \cdot 10^4$	$(2.2 \pm 1.1) \cdot 10^{12}$	$(1.1 \pm 0.5) \cdot 10^{-10}$	$(3.4 \pm 1.7) \cdot 10^{14}$	$(1.1 \pm 0.6) \cdot 10^{-8}$
B1B-cal-80_0	13.24	17.05	13.2 ± 1.8	$(5.5 \pm 2.4) \cdot 10^4$	$(1.0 \pm 0.3) \cdot 10^{12}$	$(6.1 \pm 1.8) \cdot 10^{-11}$	$(1.0 \pm 0.4) \cdot 10^{14}$	$(3.9 \pm 1.7) \cdot 10^{-9}$
B1B-cal-110_0	13.98	14.46	14.4 ± 1.9	$(5.2 \pm 2.1) \cdot 10^4$	$(9.8 \pm 2.7) \cdot 10^{11}$	$(6.8 \pm 1.9) \cdot 10^{-11}$	$(8.2 \pm 3.3) \cdot 10^{13}$	$(3.7 \pm 1.5) \cdot 10^{-9}$
B1B-cal-140_0	14.53	11.87	14.2 ± 1.0	$(9.5 \pm 2.5) \cdot 10^3$	$(5.4 \pm 2.7) \cdot 10^{12}$	$(4.5 \pm 2.3) \cdot 10^{-10}$	$(8.3 \pm 2.2) \cdot 10^{14}$	$(4.5 \pm 1.2) \cdot 10^{-8}$
B1B-cal-180_0	16.21	8.57	15.3 ± 1.2	$(3.6 \pm 1.7) \cdot 10^3$	$(6.2 \pm 3.3) \cdot 10^{12}$	$(7.3 \pm 3.9) \cdot 10^{-10}$	$(4.2 \pm 2.0) \cdot 10^{14}$	$(3.2 \pm 1.5) \cdot 10^{-8}$
B1B-cal-240_0	16.70	6.16	16.4 ± 1.0	$(3.8 \pm 1.8) \cdot 10^3$	$(1.6 \pm 0.8) \cdot 10^{12}$	$(2.6 \pm 1.4) \cdot 10^{-10}$	$(1.5 \pm 0.7) \cdot 10^{14}$	$(1.6 \pm 0.8) \cdot 10^{-8}$
B1B-cal-500_0	18.23	3.44	18.0 ± 5.4	$(9.6 \pm 2.2) \cdot 10^2$	$(5.5 \pm 3.0) \cdot 10^{11}$	$(1.6 \pm 0.9) \cdot 10^{-10}$	$(1.8 \pm 0.4) \cdot 10^{13}$ [b]	$(3.4 \pm 0.8) \cdot 10^{-9}$ [b]

Notes

[a] When ^{13}CS or C^{34}S isotopologues are not detected, ^{13}CS column densities are determined from that of C^{34}S or CS, applying the isotopic ratios CS/^{13}CS ≈ 60 and C^{34}S/^{13}CS ≈ 8/3.

[b] Upper bound values.

[c] Column densities are obtained from that of the isotopologue $H_2{}^{34}S$, using $H_2S/H_2{}^{34}S \approx 22.5$.

Table B.2: Barnard 1b physical conditions and SO abundances.

Source name	T_{dust} (K)	A_v (mag)	T_{gas}(K)	n_H (cm^{-3})	N(SO) (cm^{-2})	N(SO) / N(H_T)
B1B-cal-0_0	11.90	76.00	9.8 ± 1.4	$(6.3 \pm 3.0) \cdot 10^5$	$(2.4 \pm 0.6) \cdot 10^{14}$	$(1.5 \pm 0.4) \cdot 10^{-9}$
B1B-cal-10_0	11.72	59.80	10.1 ± 1.5	$(4.2 \pm 2.8) \cdot 10^5$	$(2.5 \pm 0.9) \cdot 10^{14}$	$(2.1 \pm 0.8) \cdot 10^{-9}$
B1B-cal-20_0	11.72	45.80	10.9 ± 1.7	$(1.6 \pm 0.9) \cdot 10^5$	$(2.7 \pm 1.0) \cdot 10^{14}$	$(2.9 \pm 1.1) \cdot 10^{-9}$
B1B-cal-30_0	11.54	38.70	11.9 ± 1.0	$(1.0 \pm 0.4) \cdot 10^5$	$(2.4 \pm 1.6) \cdot 10^{14}$	$(3.2 \pm 2.1) \cdot 10^{-9}$
B1B-cal-40_0	11.54	28.39	12.1 ± 1.0	$(1.0 \pm 0.4) \cdot 10^5$	$(9.9 \pm 4.5) \cdot 10^{13}$	$(1.7 \pm 0.8) \cdot 10^{-9}$
B1B-cal-50_0	12.39	20.00	13.2 ± 1.0	$(4.7 \pm 2.2) \cdot 10^4$	$(5.2 \pm 1.7) \cdot 10^{13}$	$(1.3 \pm 0.4) \cdot 10^{-9}$
B1B-cal-60_0	12.67	20.00	12.3 ± 1.0	$(3.1 \pm 1.6) \cdot 10^4$	$(4.8 \pm 1.6) \cdot 10^{13}$	$(1.2 \pm 0.4) \cdot 10^{-9}$
B1B-cal-80_0	13.24	17.05	13.2 ± 1.8	$(5.5 \pm 2.4) \cdot 10^4$	$(2.2 \pm 0.8) \cdot 10^{13}$	$(6.5 \pm 2.3) \cdot 10^{-10}$
B1B-cal-110_0	13.98	14.46	14.4 ± 1.9	$(5.2 \pm 2.1) \cdot 10^4$	$(3.4 \pm 1.9) \cdot 10^{13}$	$(1.2 \pm 0.7) \cdot 10^{-9}$
B1B-cal-140_0	14.53	11.87	14.2 ± 1.0	$(9.5 \pm 2.5) \cdot 10^3$	$(4.2 \pm 2.2) \cdot 10^{13}$	$(1.8 \pm 0.9) \cdot 10^{-9}$
B1B-cal-180_0	16.21	8.57	15.3 ± 1.2	$(3.6 \pm 1.7) \cdot 10^3$	$(4.9 \pm 2.4) \cdot 10^{13}$	$(2.9 \pm 1.4) \cdot 10^{-9}$
B1B-cal-240_0	16.70	6.16	16.4 ± 1.0	$(3.8 \pm 1.8) \cdot 10^3$	$(4.9 \pm 2.6) \cdot 10^{13}$	$(4.0 \pm 2.1) \cdot 10^{-9}$
B1B-cal-500_0	18.23	3.44	18.0 ± 5.4	$(9.6 \pm 2.2) \cdot 10^2$	$(1.5 \pm 0.3) \cdot 10^{12}$ [a]	$(2.2 \pm 0.5) \cdot 10^{-10}$ [a]

Notes
[a] Upper bound values

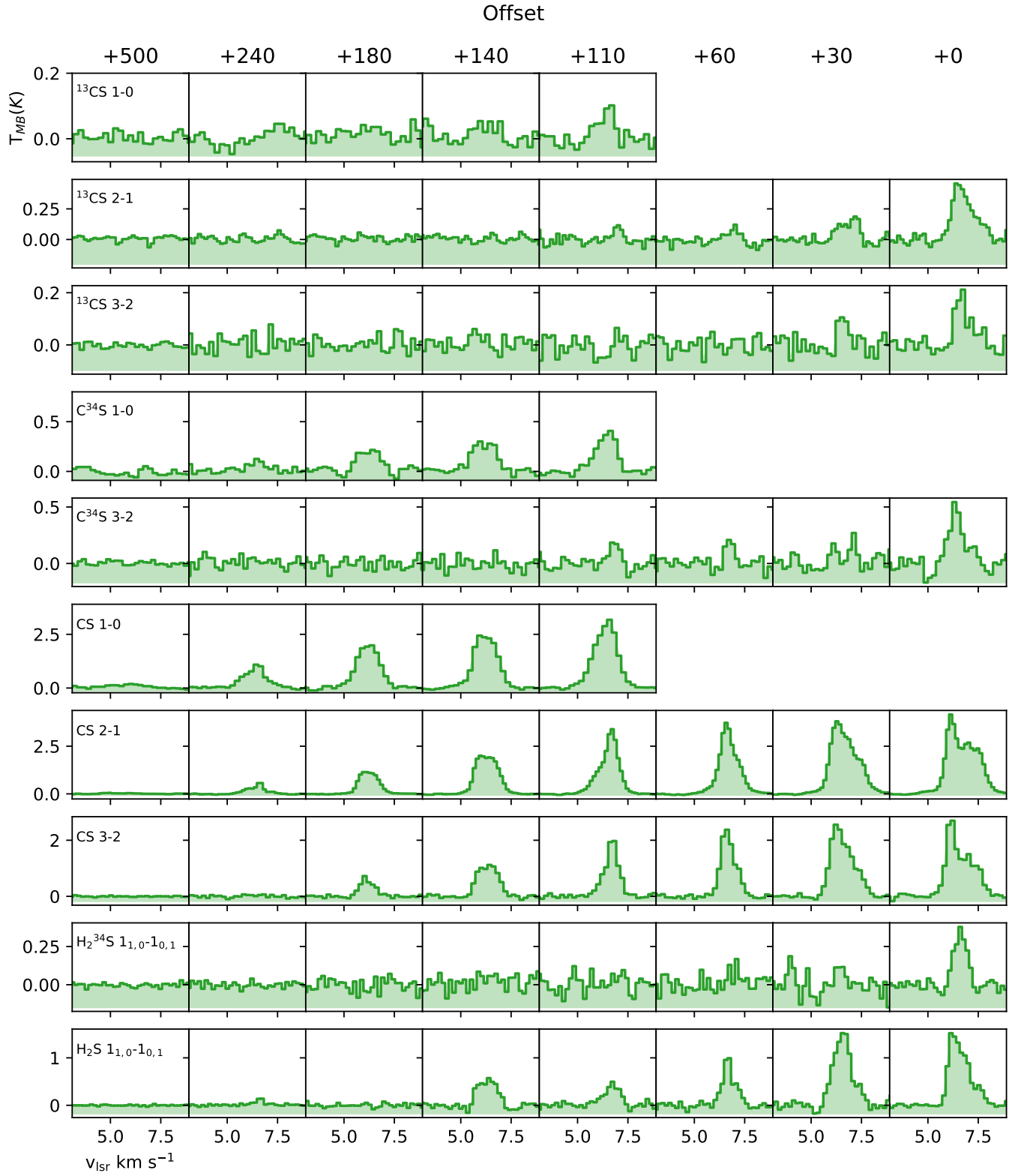

Fig. B.1: Single dish spectra of ^{13}CS 1 → 0, ^{13}CS 2 → 1, ^{13}CS 3 → 2, C^{34}S 1 → 0, C^{34}S 2 → 1, C^{34}S 3 → 2, CS 1 → 0, CS 2 → 1, C^{34}S 3 → 2 transitions towards positions with offsets (+0”, 0”), (+30”, 0”), (+60”, 0”), (+120”, 0”), (+180”, 0”), (+240”, 0”) in the Barnard 1b filament. The systemic velocity is v_{lsr} = 6.5 km s^{-1}.