RESULTS FROM A THREE POSITION SPECTRAL SCAN IN THE SGR B2 MOLECULAR CLOUD CORE

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We report on results from an ongoing spectral scan of four nearby positions in the Sgr B2 molecular cloud using SEST (Swedish-ESO Submillimeter Telescope). The antenna beam size is approximately 22″ in the frequency range 226–245 GHz presently covered. This high angular resolution allows detailed studies of the physical and chemical conditions in the warm and compact cores discovered (Vogel et al. 1987, Goldsmith et al. 1987) inside the region previously surveyed in the 3 mm band with lower angular resolution (Cummins et al. 1986, Turner 1989, beam sizes of 1.5–2.9′ and 1–2′, respectively). The Sgr B2(OH) position used by these investigators is located about 30″ south of our M position, and hence the cores M and N will contribute to the observed spectral line emissions to a larger or lesser extent.

The spectral differences between the positions we observe are very striking, see Figure 1. While the line density is high in the warm cores M and N the lines are rare in the 2′N position (Table 1). Some 30 molecules have been observed toward the M and N cores, while only 12 species have been detected toward the 2′N position chosen since $HOCO^+$ peaks here (Minh et al. 1988). Also the NW position, where Nobeyama observations indicate a large column of gas, exhibits few emission lines. Some 100 U-lines remain to be identified for the N core and some 20 toward M.

Similar to SO (Goldsmith et al. 1987) the dominant SO_2 emission emanates from core M, which may be an outflow region (Vogel et al. 1987). In contrast the emissions from CH_3OH, $HCOOCH_3$, $(CH_3)_2O$, as well as CH_3CN, C_2H_3CN and C_2H_5CN are strongly peaking in the warmer, and more massive core N.

Table 1. Adopted Sgr B2 source positions and the observed average line densities

Source	α(1950) h m s	δ(1950) ° ′ ″	No. of lines per GHz
M	17 44 10.4	−28 22 02	12
N	17 44 10.1	−28 21 16	30
2′N	17 44 10.4	−28 20 17	2
NW	17 44 06.6	−28 21 18	2

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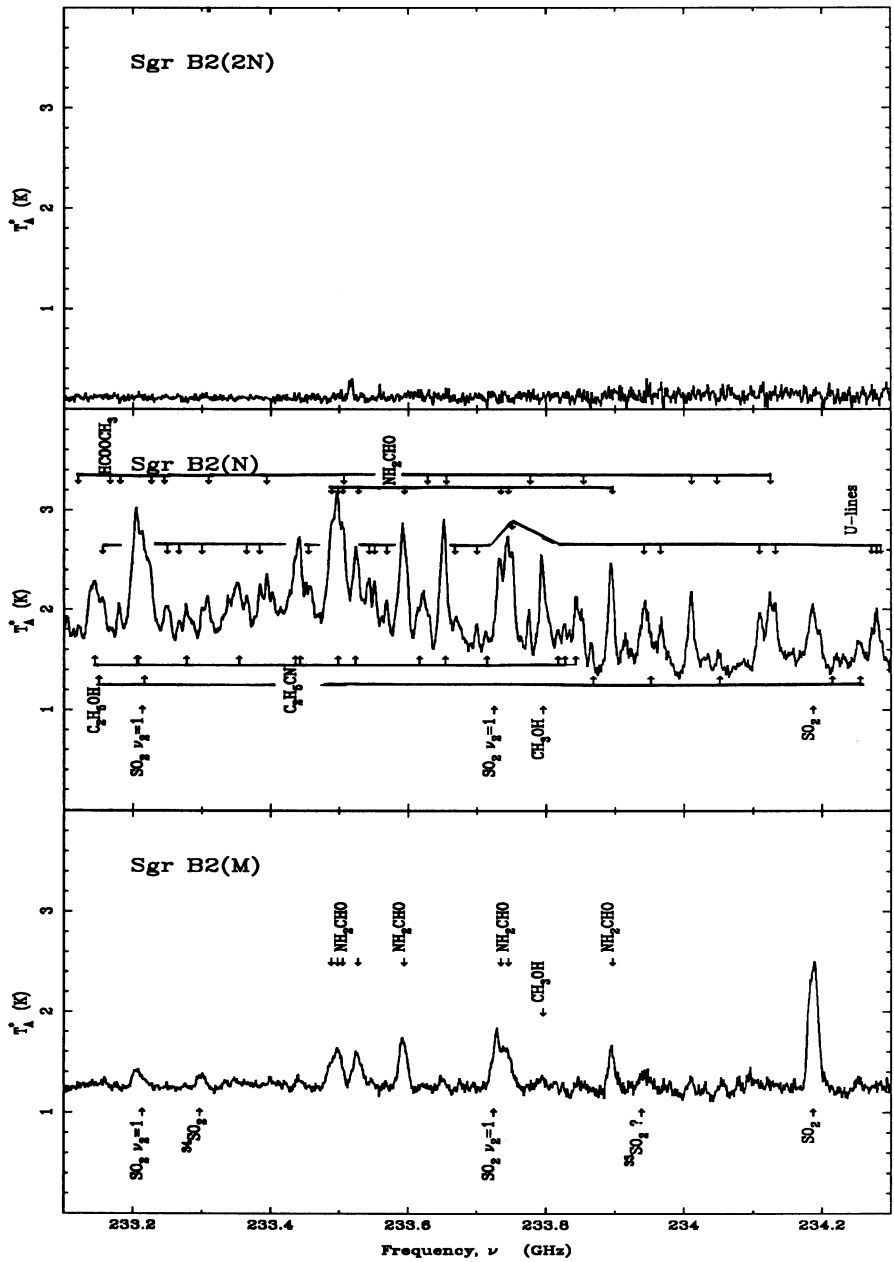

Figure 1. Sample spectra around 234 GHz toward three positions in the Sgr B2 molecular cloud