

350 GHz SIS Receiver Installed at SEST

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At SEST an SIS receiver for the 350 GHz (0.8 mm) atmospheric window was installed during the maintenance period of April/May 1992 and is now available to the astronomical community. The receiver was built by Chalmers University of Technology, Sweden.

The receiver is tunable from 328 GHz to 354 GHz with the present local oscillator. Single sideband temperatures are between 320 K and 480 K across the band, with a minimum at the CO J=3-2 frequency at 345 GHz (see Fig. 1).

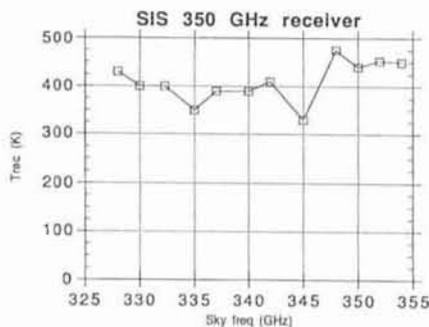


Figure 1.

Due to a long bad weather period, test observations with the new receiver could be performed only for one day. During these observations the receiver

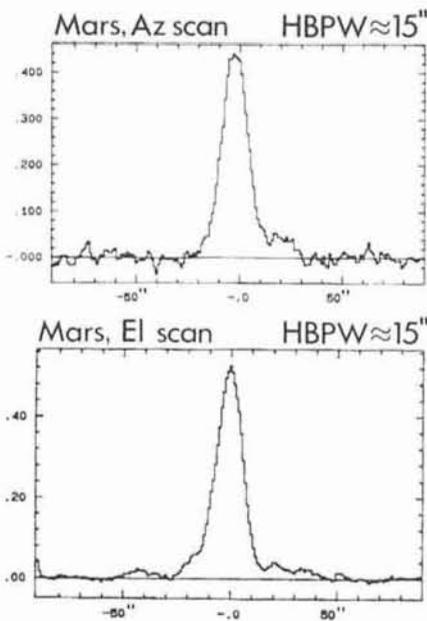


Figure 2.

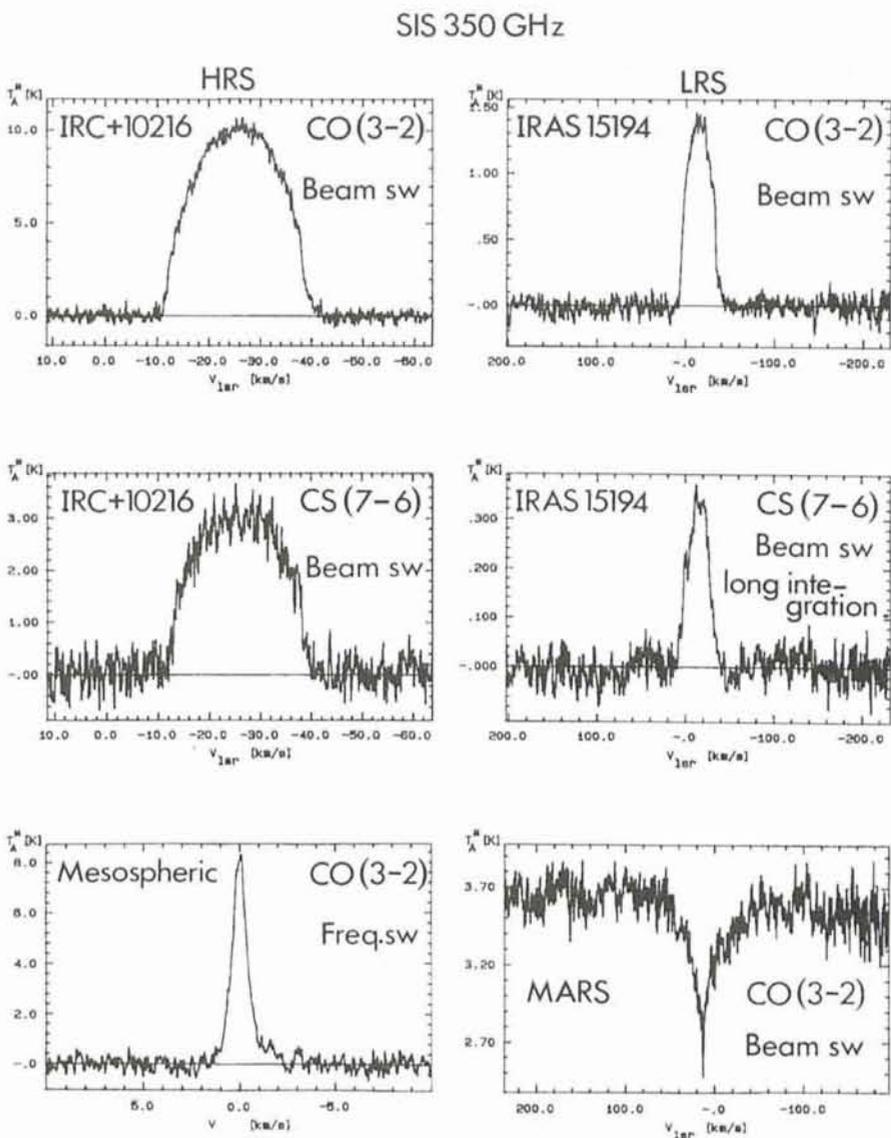


Figure 3.

temperature was 330 K (SSB), zenith opacity between 0.6 and 0.8, and the lowest system temperatures above the atmosphere were just above 1000 K. The receiver is easy to tune, and was used in the three observing modes, position switching, beam switching and frequency switching. From an azimuth and elevation scan across Mars (Fig. 2) we derive a FWHM width of the 350 GHz beam of 15'' in both directions, with sidelobes below the 15% level. A scan across the moon shows a wide low level error lobe with an extent of about $\pm 2.5'$ (arcmin). The aperture and beam efficiency at 345 GHz, derived

from observations of planets, are 0.16 and 0.25 respectively.

Figure 3 shows some of the spectra obtained during the test observations. We measured the CO J=3-2 (345.8 GHz) and CS J=7-6 (342.9 GHz) emission towards IRC+10216 and IRAS 15194 in beam switch mode. No baselines were removed. The quality of the baseline after a long integration can be seen in the CS J=7-6 spectrum of IRAS 15194 (integration time 68 minutes). Also shown are the mesospheric CO J=3-2 line obtained in frequency switch mode, and the CO J=3-2 absorption in Mars' atmosphere.