Abstracts

The Submillimeter Wave Astronomy Satellite

P.F. Goldsmith, A. Dalgarnot, N.R. Erickson, G.G. Fazio, M. Harwit, D.J. Hollenbach, D.G. Koch, G.J. Melnick, D.A. Neufeld, R. Schieder, R.L. Snell, J. Stauffer, P. Thaddeus and G.F. Winnewisser. "The Submillimeter Wave Astronomy Satellite." 1991 MTT-S International Microwave Symposium Digest 91.1 (1991 Vol. I [MWSYM]): 395-398.

The Submillimeter Wave Astronomy Satellite (SWAS) was selected for development and flight by NASA in 1989 as one of the initial payloads in the Small Explorer program. SWAS is the first instrument designed to carry out submillimeter astronomical observations of spectral lines from space. Spectral lines of H/sub 2/, O/sub 2/, /sup 13/CO, and atomic carbon, which are extremely difficult to observe from the ground but which are potentially important tracers of the structure of dense clouds in the interstellar medium, will be simultaneously observed with high spectral resolution. Incoming radiation is collected by a 55 x 71-cm offset Cassegrain antenna, with an aggregate surface error <= 9 µm rms. The receiver front end consists of two independent cooled Schottky diode harmonic mixers, each pumped by frequency-tripled phaselocked Gunn oscillator. Spectral analysis is performed on the 4 lines from the two mixers simultaneously by an acousto-optical spectrometer having a bandwidth of 1.4 GHz, and a frequency resolution of 1 MHz.

❑ Return to main document.