

**Submillimeter Wave Astronomy Satellite:
I. Observational Performance and Lessons Learned**

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The Submillimeter Wave Astronomy Satellite (SWAS), launched in 1998, is a NASA mission dedicated to the study of star formation and molecular cloud composition through the use of high spectral resolution heterodyne observations of low-lying transitions of water, isotopic water, molecular oxygen, isotopic carbon monoxide, and atomic carbon. To date, the mission has proceeded exceptionally smoothly. During this time, SWAS has demonstrated its ability to map large areas as well as to obtain spectra with r.m.s. baseline noises as low as a few mK. This contribution will review several key instrument performance parameters relating to the detection of weak lines, such as radiometer stability and understanding the nature of the spectral noise, as well as those requirements imposed by the need to fully interpret absorption features, such as knowledge of dust continuum levels and receiver sideband ratios. We will also review some of the observational lessons learned. In particular, we will discuss several important results of the SWAS observations as they apply to the spatial extent of water, atomic carbon, and isotopic carbon monoxide emission and the requirements these measurements will place on FIRST's need to obtain reference positions devoid of line radiation. Finally, we will review the advantages, realized on SWAS, of flexibly scheduling observations and their follow up.