



"Image of Saturn at 6 cm wavelength made at the National Radio Astronomy Observatory's Very Large Array in New Mexico. The banded structure is due to variations of ammonia concentration in the subcloud Saturn atmosphere that are related to the general circulation at deep levels. . . . The rings are inherently faint at microwave frequencies but are readily identified in the image." [From the dust jacket of *Atmospheric Remote Sensing by Microwave Radiometry*; courtesy of Arie W. Grossman and Duane O. Muhleman]

both from the ground and from satellites. It is also employed extensively from various platforms for a wide range of scientific investigations. *Atmospheric Remote Sensing by Microwave Radiometry* is a detailed treatment of remote sensing by microwave techniques of the atmospheres of Earth and other planets.

Weighting functions are widely used in the remote sensing community to describe the information content of passive measurements of temperature profiles. They are often misused in measurements of constituent profiles. Westwater's chapter, "Ground-based microwave remote sensing of meteorological variables," contains a general discussion of weighting functions that provides a common theoretical basis for both applications. This chapter should be required reading for anyone involved in passive remote sensing in any spectral region.

It is inevitable that in a book of this scope any given reader will find shortcomings in the coverage of his or her own specialty. In this spirit I wish that Gasiewski, in his chapter "Microwave radiative transfer in hydrometeors," had illustrated his concepts with an example in a portion of the spectrum commonly used for rainfall measurements, which would have provided a better background for the discussions of the measurement of rainfall from satellites that appear further on in the book. Also, in Grody's chapter "Remote sensing of the atmosphere from satellites using microwave radiometry" I was disappointed by the absence of any discussion of the measurement of precipitable water. It was clear from his treatment of the measurement of water vapor profiles that

he had not read Westwater's discussion of weighting functions.

Like many multiauthored compilations, the book suffers from some redundancy among the chapters, although the various authors' different approaches to the common themes can be interesting and instructive. All the chapters have substantial depth, but some are more accessible than others. Rosenkrantz's contribution ("Absorption of microwaves by atmospheric gases") will be almost impossible reading for anyone without some background in quantum mechanics.

This book belongs on the desk of anyone working (or planning to work) in the atmospheric appli-

cations of microwave radiometry. Those working in other branches of remote sensing will find many of the ideas presented here useful as well. Those merely curious about the field will find it rather slow going.

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