

MICROWAVE TEMPERATURE SOUNDING OF THE MESOSPHERE
AND UPPER STRATOSPHERE

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ABSTRACT

The temperature of the mesosphere and upper stratosphere may be sounded passively from space at wavelengths near the 5-mm oxygen absorption band. The present AAFE program to develop a satellite experiment for these purposes is reviewed together with the scientific basis for the technique.

Introduction

The ultimate capability of the present numerical weather forecasting models has never been tested. This is due to the fact that data is not yet available to define adequately the input conditions on a world wide basis.

One way of obtaining the necessary data is by means of remote sounding from a single satellite in a polar orbit. Radiometers, both in the infrared and microwave regions of the spectrum, have been suggested for this task. Of these, a microwave instrument tuned to frequencies in the 60 GHz oxygen complex would have the unique capabilities of (1) being able to probe from the surface up to mesosphere altitudes and (2) being insensitive to cloud cover. Using this instrument it would be possible to infer the tempera-