

Abstract

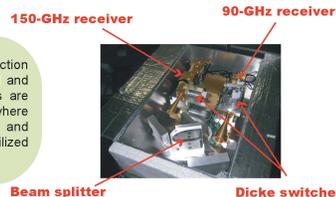
A new 90/150-GHz microwave radiometer (MWRHF), recently acquired by the ARM program, has been collecting data at the Southern Great Plains (SGP) since October 2006. The purpose of the instrument is to improve retrievals of low amounts of liquid water. We present the instrument and show preliminary data collected at the SGP Central Facility site. Collected measurements are analyzed and compared with model computations.

Instrument description

The radiometer is equipped with a 2-speed dew blower, a GPS clock receiver and a rain sensor



The radiometer has two direct detection receiver units. All channels are detected and integrated simultaneously. The receivers are based on the "direct detection" technique where the signal is directly amplified, filtered and detected. The receivers are thermally stabilized to an accuracy of 0.02 K.



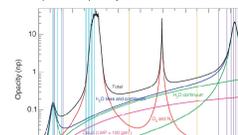
Absolute calibration is achieved with a LN2 target. The procedure is repeated every few months. Routinely, tip curves and an ambient target are used to update the calibration parameters.



Measurements

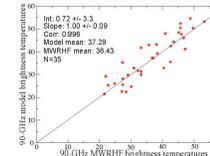
The MWRHF measures brightness temperatures from two channels T 90 and 150-GHz. These two frequencies are located in the window region of the microwave spectrum and they are sensitive to cloud liquid water. The water vapor contribution comes from the water vapor continuum region.

Atmospheric opacity as a function of frequency.



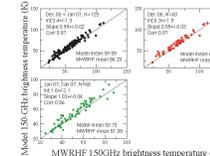
The calibration parameters for the 90-GHz channel were updated on March 1, 2007. Following the updates the agreement with the model has improved.

MWRHF 90-GHz measurements March 2007



The 150-GHz channel displays a good agreement with the model. **This channel has not been working since February 25 2007.** The probable cause of the problem is a malfunction of the Dicke switch used to calibrate the channel.

MWRHF 150-GHz measurements Dec 2006-Jan 2007



Summary

- * The radiometer is operating at the SGP CF since October, 2006
- * The testing period has been used to assess calibration and determine calibration parameters
- * Preliminary evaluation of data and model comparison show a good agreement for both channels
- * There is right now a problem with the 150-GHz channel. The problem is being discussed with the manufacturer. Possible cause of the problem is a hardware malfunction.