

A Comparison of Power Measurements from 100 GHz to 600 GHz

Qun Xiao, Yiwei Duan, and Jeffrey Lee Hesler

University of Virginia

Abstract

The accurate measurement of absolute power at millimeter and submillimeter wavelengths is difficult, and different power meters can give substantially different results, thus complicating comparisons between measurements by different groups. This talk will present a comparison of measurements done using a variety of commonly used power meters over a frequency range from 100 GHz to 600 GHz.

In the WR-10 frequency range we will compare power measurements using an HP-437B power meter with W8486A sensor, an Anritsu ML83A power meter with a WR-8 power sensor, a Thomas-Keating (TK) absolute power meter, and an Erickson PM-1 calorimeter power meter. Each of these meters will be used to measure the power output from a Gunn oscillator.

In the WR-3 frequency range, we will compare the measurement results of the Anritsu ML83A power meter with both WR-3 and WR-8 power sensors, the Erickson PM-1, and the TK absolute power meter. The power source is a WR-10 to WR-3 frequency tripler. A measurement comparing measured power from 210-250 GHz for several different meters is shown in the figure below. Finally, these same meters will also be used for measurements in the WR-1.7 frequency range from 440-660 GHz.

