Abstracts

Power and Spatial Mode Measurements of Sideband Generated, Spatially Filtered, Submillimeter Radiation

E.R. Mueller and J. Waldman. "Power and Spatial Mode Measurements of Sideband Generated, Spatially Filtered, Submillimeter Radiation." 1994 Transactions on Microwave Theory and Techniques 42.10 (Oct. 1994 [T-MTT]): 1891-1895.

The first coherent measurement of submillimeter-wave sideband generator (SBG) output power is reported here. This SBG utilzes a submillimeter laser, microwave synthesizer, and high frequency Schottky diode to produce tunable radiation. Record efficiency and output power (10.5 μW) at a drive frequency of 1.6 THz has been obtained, and SBG radiation was efficiently separated from the laser driver with Si etalons. The power measurements were made using a dual CO/sub 2/-Submillimeter laser system and two Schottky diodes, one as the sideband generator and one as the receiver. The SBG efficiency of four different models of University of Virginia (UVa) diodes were studied and the first measurement of the output mode of the sideband (without the unshifted laser present) was also performed. Finally, confirmation of the optimal parameters for coupling a Gaussian beam into a corner-reflector mounted Schottky diode is presented.

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