Abstracts

Multiple Quantum Effects at Millimeter Wavelengths

R.H. Pantell and R.G. Smith. "Multiple Quantum Effects at Millimeter Wavelengths." 1963 Transactions on Microwave Theory and Techniques 11.5 (Sep. 1963 [T-MTT]): 317-324.

When a quantum mechanical system interacts with a radiation field it may do so by multiple as well as single quantum processes. These multiple quantum processes give rise to nonlinear effects such as harmonic generation and parametric amplification and oscillation. The density matrix formulation is used to describe these multiple quantum processes. Two- and three-level systems are considered as forms of harmonic generators and some of the desired properties of the materials to be used are described. Two methods of generating submillimeter radiation starting with optical signals are also discussed.

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