Abstracts

Quantum Fluctuations in Microwave Radiometry

L.P. Bolgiano, Jr.. "Quantum Fluctuations in Microwave Radiometry." 1961 Transactions on Microwave Theory and Techniques 9.4 (Jul. 1961 [T-MTT]): 315-321.

This paper assesses the possible significance of the quantum nature of electromagnetic radiation in limiting the measurement accuracy attainable with a microwave radiometer. Analogies are shown to exist between the form of a formula describing fluctuations in the radiometer output, and both a formula describing the radiometer input signal, and also, a formula describing the output of a photocell detector. Detailed quantum mechanical consideration of the processes of amplification and detection are circumvented by considering how the formula for fluctuations in the radiometer output might be modfied so as to make it consistent with the measurement precision implied by these other formulas. A modified formula is suggested which includes a quantum fluctuation whose magnitude depends on signal power.

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