Abstracts

Coherent Spontaneous Microwave Emission by Pulsed Resonance Excitation

L.E. Norton. "Coherent Spontaneous Microwave Emission by Pulsed Resonance Excitation." 1957 Transactions on Microwave Theory and Techniques 5.4 (Oct. 1957 [T-MTT]): 262-265.

This paper describes an investigation of the coherent microwave emission from pulse-excited ammonia molecules. Coherent and periodic pulses of near resonance frequency and 1-µsec duration excited the gas from its initial thermal equilibrium condition. Self-induced coherent emission (molecular ringing) continued after the excitation field was removed. This radiation was observed during a period of 10 µsec. In an actual experiment performed, a new Doppler bandwidth reduction method was used in the gas cell. The observed spectral width of the ammonia 7,7 line was about 5 kc. The emission was used to stabilize the excitation signal source to a short-term frequency stability of 2 X 10/sup -10/.

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