Abstracts

Proposal for a Tunable Millimeter Wave Molecular Oscillator and Amplifier

J.R. Singer. "Proposal for a Tunable Millimeter Wave Molecular Oscillator and Amplifier." 1959 Transactions on Microwave Theory and Techniques 7.2 (Apr. 1959 [T-MTT]): 268-272.

An atomic beam apparatus suitable for a millimeter wave generator is theoretically discussed. The beam consists of atoms having a net magnetic moment. The upper and lower Zeeman levels of the atomic beam in a magnetic field are spatially separated by an inhomogeneous magnetic field. The upper state atoms enter a cavity where transitions occur at a frequency determined by a static magnetic field. The resonant frequency of the cavity is set at the transition frequency. The positive feedback of the cavity allows operation as an oscillator. Some of the more important parameters for oscillator operation are evaluated.The upper frequency limit is determined primarily by the resonant structure design.

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