Abstracts

A Molecular Resonance AFC System for Millimeter Oscillators

M.E. Cram and D.T. Paris. "A Molecular Resonance AFC System for Millimeter Oscillators." 1968 Transactions on Microwave Theory and Techniques 16.8 (Aug. 1968 [T-MTT]): 548-553.

An investigation was made of a millimeter-wave oscillator AFC system utilizing the inherent stability of a molecular rotational transition as a reference. A unique frequency discriminator, based on Stark modulation of the J=1 --> 2 transition of methyl fluoride, CH/sub 3/F, was used to stabilize a reflex klystron. The stabilized frequency was approximately 102.2 GHz. Experimental data indicate that a closed-loop stability of about one part in 10/sup 7/ per hour was achieved. The long-term stability thus obtained is comparable to that of a phase-locked oscillator utilizing a low-frequency quartz crystal oscillator as a reference.

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