# Abstracts

## Quasi-Optical VCOs

*T. Mader, S. Bundy and Z.B. Popovic. "Quasi-Optical VCOs." 1993 Transactions on Microwave Theory and Techniques 41.9 (Oct. 1993 [T-MTT] (Special Issue on Quasi-Optical Techniques)): 1775-1781.*

Quasi-optical grid voltage controlled oscillators are presented. These VCOs are the first demonstration of a quasi-optical system consisting of several periodic arrays loaded with solid-state devices. A quasi-optical VCO consists of an array of oscillators, a variable capacitance array, and a mirror. The mirror provides feedback for locked power combining of a large number of MESFET oscillators that load a two-dimensional metal grid on a dielectric substrate. The frequency can be electrically tuned either with gate bias or with another array loaded with varactor diodes. When the varactor bias voltage is changed, the capacitance of the diodes changes, which in turn modulates the frequency of the output power-combined wave. Two types of arrays are presented, one consisting of short dipoles, and the other of bow-tie elements. As expected, the bow-tie VCO has better performance than the dipole VCO, due to its broadband impedance. A 10% tuning bandwidth with less than 2 dB power change was measured in the case of a bow-tie VCO.

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