Abstracts

A seven-element S-band coupled-oscillator controlled agile-beam phased array

R.J. Pogorzelski, R.P. Scaramastra, J. Huang, R.J. Beckon, S.M. Petree and C.M. Chavez. "A seven-element S-band coupled-oscillator controlled agile-beam phased array." 2000 Transactions on Microwave Theory and Techniques 48.8 (Aug. 2000 [T-MTT]): 1375-1384.

This paper describes the design, fabrication, and testing of a seven-element S-band phased array, in which the beam is steered by means of a coupled-oscillator technique. Seven monolithic-microwave integrated-circuit-based voltage-controlled oscillators were coupled via microstrip transmission lines in such a manner that they mutually injection locked and, thus, oscillated as an ensemble. The output of each oscillator was connected to a microstrip patch array element and the seven elements were disposed in a line on a Duroid substrate. The resulting antenna was characterized in benchtop tests, revealing the relative phase behavior of the oscillators, and in range tests, producing far-field pattern cuts. Patterns showing beams steered to several angles were obtained by applying appropriate tuning voltages to the end oscillators of the array.

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