Abstracts

Active Antenna Array Behavior

D.E.J. Humphrey, V.F. Fusco and S. Drew. "Active Antenna Array Behavior." 1995 Transactions on Microwave Theory and Techniques 43.8 (Aug. 1995 [T-MTT]): 1819-1825.

It has been recently demonstrated that arrays of coupled active antenna oscillating elements can be locked together by mutual radiation in order to form spatial power combining and beam steered arrays. In this paper a nonlinear coupled oscillator theory is developed which accounts for both the amplitude and phase behavior of an array of distributed coupled active antenna oscillators. In its canonical form the theory can be used to describe the behavior of any number of spatially displaced coupled elements placed in a chain. These elements can have unequal spacing and they can have arbitrary free-running oscillation frequencies. Unequal free-running amplitudes are also permitted. Experimental validation of the theory is presented for some basic cases in terms of frequency and amplitude variation under mutual injection locked conditions. In its particular form the theory developed is suited for use with recently reported active antenna imaging methods.

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