

Abstracts

Measurement and Modelling of Radiative Coupling in Oscillator Arrays

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Arrays of coupled oscillators can be used for power-combining at microwave and millimeter-wave frequencies, and have been successfully demonstrated with a variety of devices. Such arrays have also recently been mode-locked for pulse generation, and can be configured for phase-shifterless beam-scanning. The nonlinear theory of coupled-oscillator phase dynamics depends crucially on the parameters describing the coupling between oscillators. Methods for experimental characterization of these parameters are described here, and simple models are developed which reproduce the measurements quite well. The models apply to radiative coupling and the effects of external reflectors which are sometimes used for stabilization. The theory is verified with a two-oscillator system.

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