Abstracts

Using Controlled Chaos for Digital Signaling: A Physical Principle for 1-Stage Waveform Synthesis

S. Hayes and C. Grebogi. "Using Controlled Chaos for Digital Signaling: A Physical Principle for 1-Stage Waveform Synthesis." 1996 MTT-S International Microwave Symposium Digest 96.3 (1996 Vol. III [MWSYM]): 1879-1882.

We consider the possibility of using controlled chaotic operation to produce complex signals directly at the high-power level in a microwave source. By implementing symbolic dynamics control, a high-power source could be guided through complex pulsed, frequency hopped, or digital information bearing sequences with negligible control power. This possibility arises because chaotic behavior is naturally complex and sensitive to small perturbations, and we can gently guide the signal through a preexisting chaotic orbit with tiny controlling perturbations. We have done this in an audio-frequency circuit, and the basic control technique could be extended to high frequencies.

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