Isochronal chaos synchronization of delay-coupled optoelectronic oscillators CRISTIAN PANDA, LUCAS ILLING, LAUREN SHARESHIAN, Reed College — We study experimentally chaos synchronization of nonlinear optoelectronic oscillators with time-delayed mutual coupling and self-feedback. Coupling three oscillators in a chain, we find that the outer two oscillators always synchronize. In contrast, isochronal synchronization of the mediating middle oscillator is found only when sufficient self-feedback is added to the middle oscillator. We show how the stability of the isochronal solution of any network, including the case of three coupled oscillators, can be determined by measuring the synchronization threshold of two unidirectionally coupled systems. In addition, we provide a sufficient condition that guarantees global asymptotic stability of the synchronized solution.

Cristian D. Panda
Reed College

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