Nonlinear Sciences > Chaotic Dynamics

Time-delayed feedback control of delay-coupled neurosystems and lasers

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We discuss applications of time-delayed feedback control to delay-coupled neural systems and lasers, in the framework of the FitzHugh-Nagumo neuron model and the Lang-Kobayashi laser model, respectively. In the context of neural systems, we will point out some complex scenarios of synchronized in-phase or antiphase oscillations, bursting patterns, or amplitude death, induced by delayed coupling in combination with delayed self-feedback in simple network motifs. For optical systems, we will show that multiple time-delayed feedback, realized by a Fabry-Perot resonator coupled to the laser, provides a valuable tool for the suppression of unwanted intensity pulsations, and leads to stable continuous-wave operation.

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