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Global Dynamics of Pulse-Coupled Oscillators. Preliminary report.

Networks of pulse-coupled oscillators can be used to model systems from firing neurons to blinking fireflies. Many past studies have focused on numerical simulations and locating the synchronous state of such systems. In this project, we construct a Poincare map for a system of three pulse-coupled oscillators and use rigorous computational techniques and topological tools to study asynchronous dynamics. We will present sample results, focusing on periodic behavior in the system. (Received September 22, 2011)