

# Phase synchronization and resonances in coupled oscillators with delay

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I will discuss systems of two coupled oscillators with delay and some results by numerical investigation on resonances and synchronization. The Mirollo-Strogatz model has been used to investigate this in detail for several coupling scenarios. Recent work by M. Zeitler (RU) on an excitatory-inhibitory coupling with delay showed that for this coupling there is no 1 : 1 locking, only higher resonances appear. I then present a more physiological model of two neural oscillators of type I and type II with weak coupling. By means of simulations and numerical bifurcation analysis with `pdde-cont` this result is corroborated for a range of coupling strengths and delays. However, 1 : 1 locking (phase synchronization) is found in some instances.