Equivalence of phase oscillator models

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Various types of phase-oscillator models are discussed to identify mutual analogies and differences. In particular, an ensemble of leaky-integrate-and-fire neurons is compared with both Winfree- and Kuramoto-type models, showing that, contrary to the common belief, relevant differences are maintained even in the weak coupling limit. The comparison is mostly made by studying the linear stability of the splay state and its possible bifurcations.