

# QUASI-PERIODIC BIFURCATION THEORY

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Invariant tori with quasi-periodic dynamics often allow to better understand the behaviour of a dynamical system. Their complexity ranges between equilibria and periodic orbits on the one side and more complicated structures of dynamics like strange attractors on the other side.

To capture the dynamics on quasi-periodic tori one should introduce parameters; both tori with dense orbits and completely resonant tori consisting of periodic orbits correspond to dense subsets of the parameter space. Under variation of parameters bifurcations can occur.

In dissipative dynamical systems the parameters are external (e.g. think of the Reynolds number, then repeated Hopf bifurcations might explain the onset of turbulence) while in Hamiltonian systems the parameters are the actions conjugate to the toral angles. Other contexts to which the theory applies include volume-preserving and reversible systems.