

Chaos and Quantum Chaos
Summer term 2021

5. Exercise

(to be presented and discussed on Monday May 17)

5.1 Homoclinic tangle

Let Γ be a loop area enclosed by the stable and unstable manifolds of a hyperbolic fixed point (see your picture generated in homework H2). According to the Poincarè recurrence theorem almost all points of Γ will return to Γ . This seems impossible, since stable and unstable manifolds cannot cross themselves.

Make a sketch demonstrating that it is possible!

As an example choose a weakly periodically driven 1D double well potential and sketch its stroboscopic phase space. (It suffices to show that just a part of Γ returns to Γ).