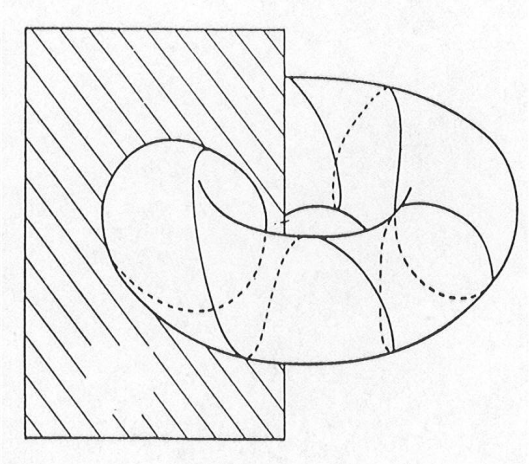
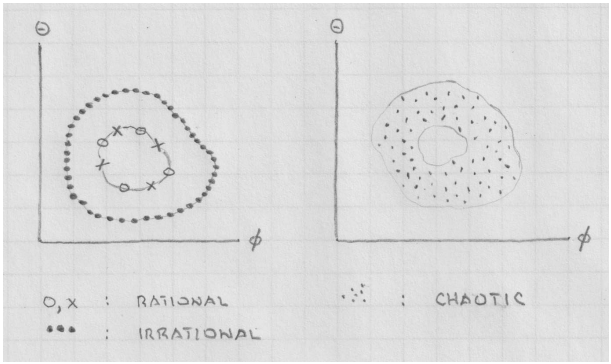
Poincaré Surface of Section [mln100]

- Calculate trajectory: $\theta(t),\ \phi(t),\ p_\theta(t),\ p_\phi(t)$.
- Select points with $p_\phi = 0,\ \dot{p}_\phi > 0$.
- Project these points onto a plane in (θ, ϕ, p_θ)-space.



Integrable system:

Invariant torus specified by two actions J_1, J_2.
Two angle coordinates, $\vartheta_1(t) = \omega_1(J_1, J_2)t + \vartheta_1^0,\ \vartheta_2(t) = \omega_2(J_1, J_2)t + \vartheta_2^0$, describe winding course of trajectory around torus.
Periodic trajectories: rational ω_1/ω_2.
Quasiperiodic trajectories: irrational ω_1/ω_2.



Nonintegrable system:

Only irrational tori exist. Space between intact tori filled by periodic trajectories and chaotic trajectories.