Dissipative Dynamical Systems [mln101]

Nature of phase flow:

- *Conservative systems*: Incompressible flow (Liouville theorem). Hamiltonian systems have even phase-space dimensionality.
- *Dissipative systems*: Progressive contraction of phase flow to some attractor. Phenomenological character of equations of motion allow for odd dimensionalities.

2D dissipative flow: Two kinds of attractors.

- Point attractors (2D → 0D) [mln73] [msl10].
- Limit cycles (2D → 1D) [mln74].

3D dissipative flow: Four kinds of attractors.

- Point attractors (3D → 0D) [msl16].
- Limit cycles (3D → 1D) [msl17].
- Toroidal attractors (3D → 2D) [msl18].
- Strange attractors (3D → fract.D) [msl19].

Rössler band: Example of strange attractor.

- Equations of motion:
  $\dot{x} = -y - z, \quad \dot{y} = x + \frac{y}{5}, \quad \dot{z} = \frac{1}{5} + z(x - 5.7).$
- Flow on attractor: stretching, folding, and squeezing.