Clase 6:
Atractores caóticos

Atractores caóticos

- Motivación en el marco de la materia
- Vamos a ver en el Colab
- Atractor de Lorenz
- Atractor de Rossler
- Bibliografía

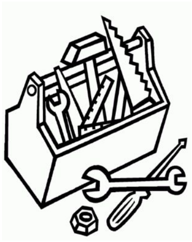
Motivación en el marco de la materia

- Sistemas dinámicos, autónomos, ODEs, N-dimensionales

$$\frac{d\vec{x}}{dt} = \vec{f}(t, \vec{x})$$ → campo vector

- Resolvemos integrando numéricamente (problema del valor inicial)

$\vec{x}(t)$ → soluciones → trayectorias, diagrama de fases



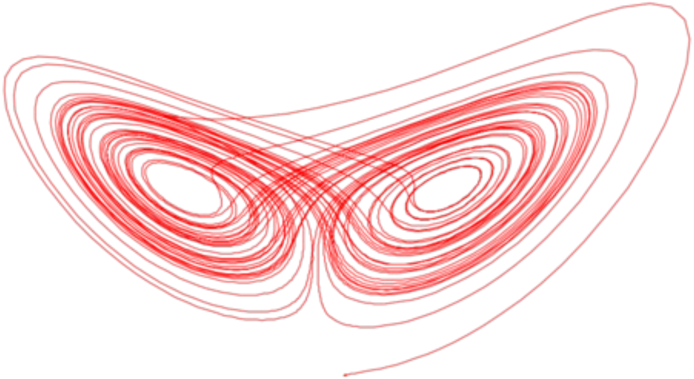
⇒ $\int$ **scipy.integrate.solve_ivp (RK45)**

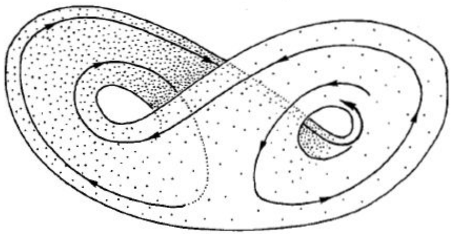
Vamos a hacer en el Colab

- Encontrar soluciones de atractores caóticos (Lorenz y Rossler)
- Diagramas de fase 3D
  - Animaciones 3D
- Mapas
- Sensibilidad con condiciones iniciales
  - Comparando soluciones

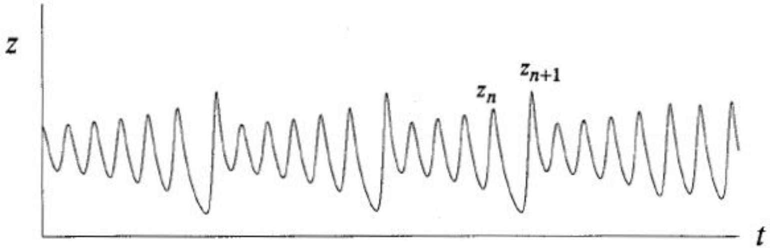
Atractor de Lorenz

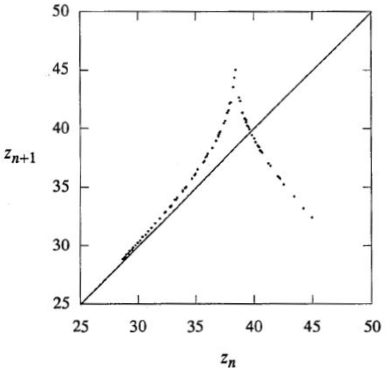
$$\dot{x} = \sigma(y - x)$$
$$\dot{y} = rx - y - xz$$
$$\dot{z} = xy - bz$$





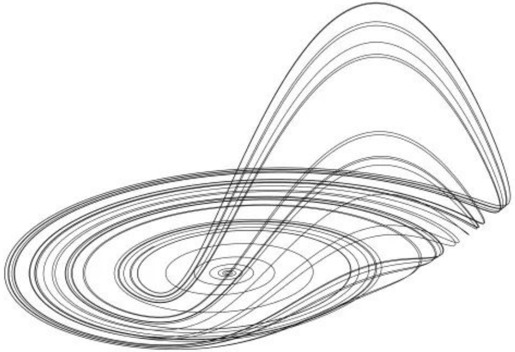
Mapas discretos

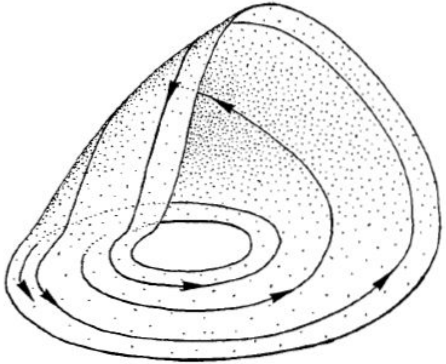




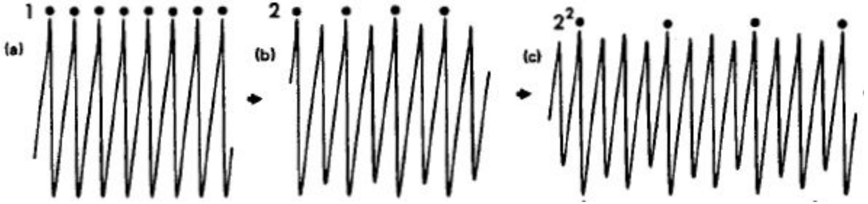
Atractor de Rossler

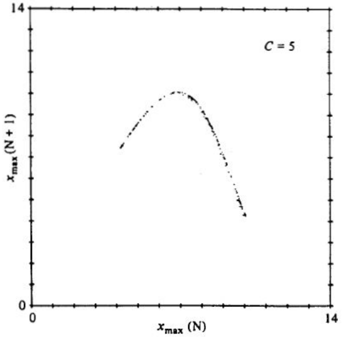
$$\dot{x} = -y - z$$
$$\dot{y} = x + ay$$
$$\dot{z} = b + xz - cz$$



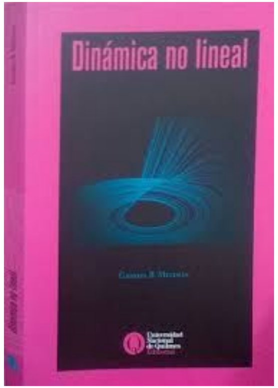


Mapas discretos

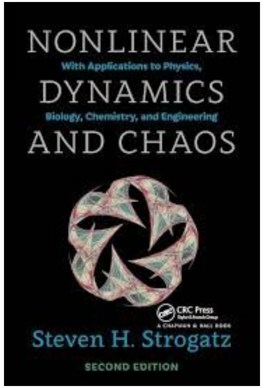




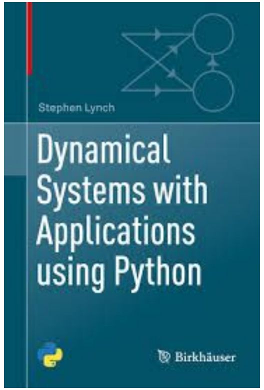
Bibliografía recomendada



Mindlin 2018



Strogatz 1994



Lynch 2018

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