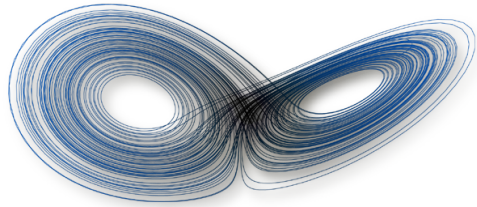

Resonance and Synchronization

Jean-Christophe Loiseau

jean-christophe.loiseau@ensam.eu
Laboratoire DynFluid
Arts et Métiers, France.

Resonance

Resonance

Damped oscillator with harmonic forcing

$$\ddot{x} + \delta x + \omega_0^2 x + \beta x^3 = \gamma \cos(\omega t)$$

Assume $\delta > 0$ (i.e. damped oscillator). How does the response of the system evolves as we vary the forcing amplitude γ and frequency ω ?

Resonance

The limiting case of the harmonic oscillator

Harm. osc. : $\ddot{x} + \omega_0^2 x = \gamma \cos(\omega t)$