Laser Chimeras as a Paradigm for Multi-stable Patterns in Complex Dynamics of Delay Systems

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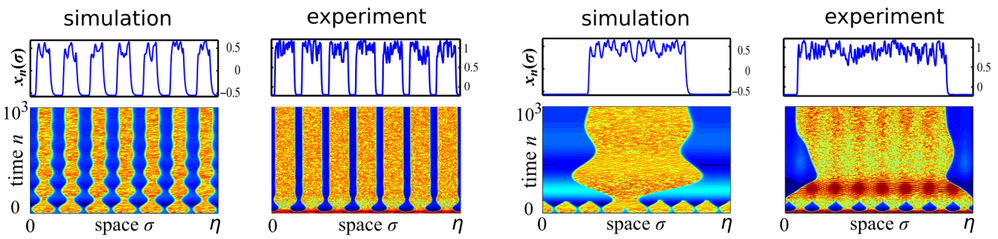
The Ikeda model with integral term

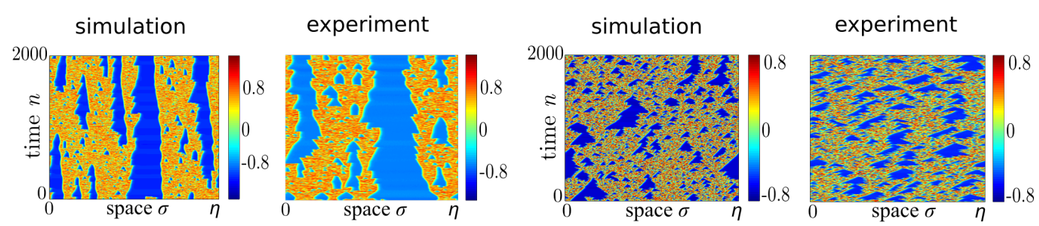
$$\varepsilon\dot{x} = -x - \delta\int_{t_0}^{t} x(\xi)\,\mathrm{d}\xi + \beta F[x(t-\tau)]$$

ε and δ are small parameters, β is gain,
$F[x] = [1 + m\sin^2(x + \Phi_0)]^{-1}$,
$m = 4$, $\Phi_0 = -0.4$.

Chimera states observation



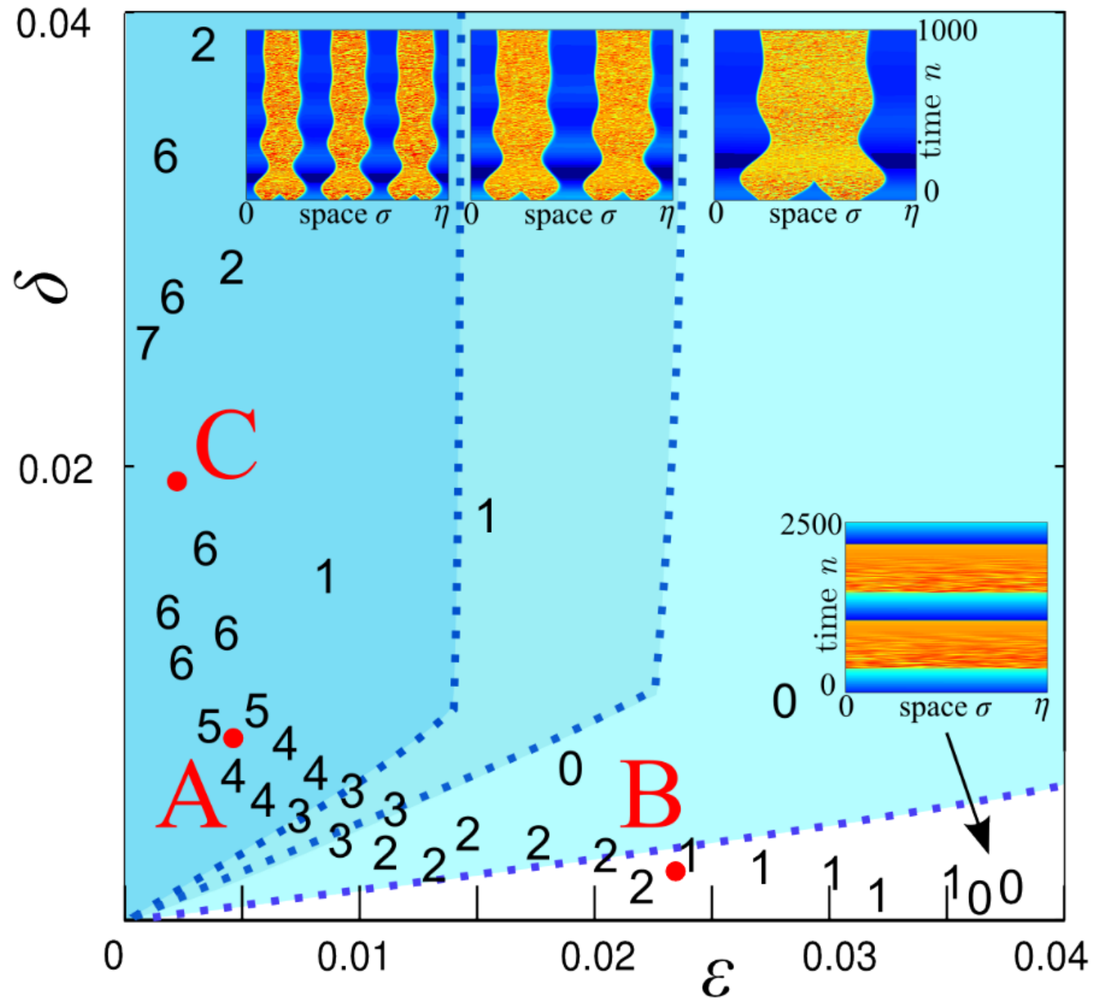
Spatio-temporal intermittency (with increase of β)



β=2.4 β=4

Parametric point A: $(\varepsilon, \delta) = (0.005, 0.008)$.

Chimera multistability



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