

Bistable solitons from nonlinear two-waves coupling

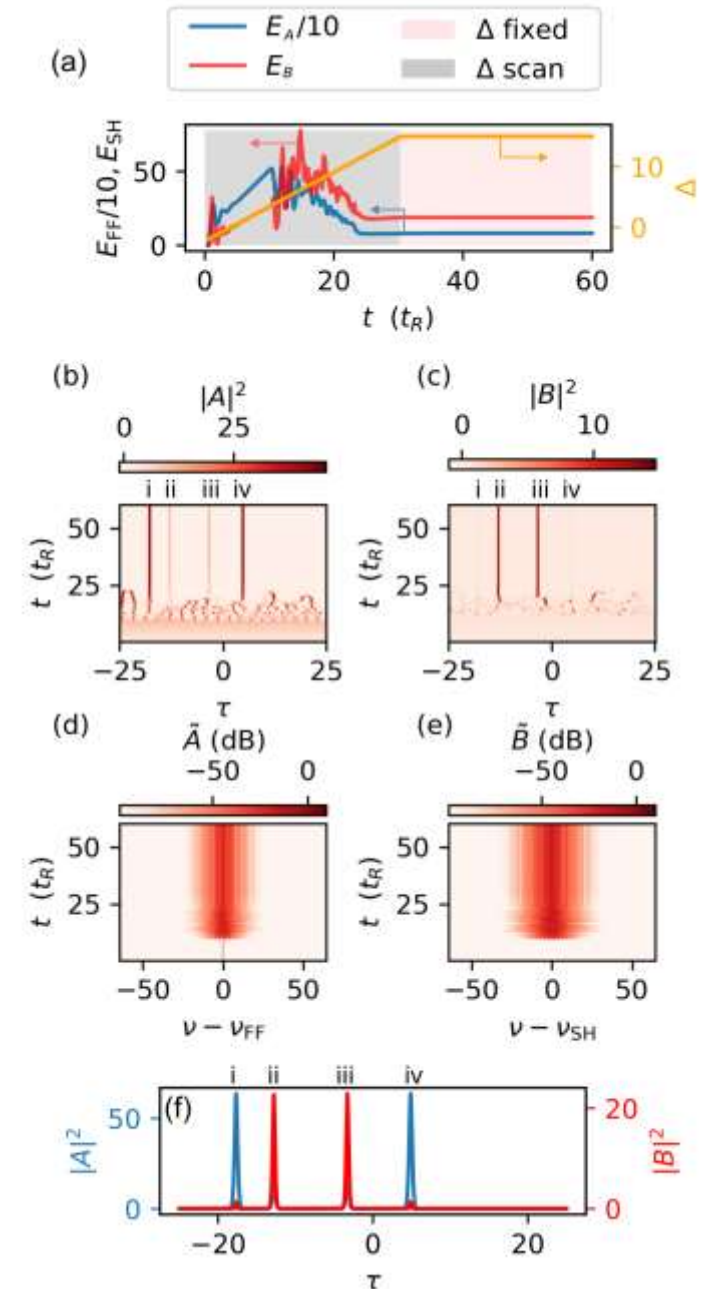
- Two mean fields GNLSEs coupled by Kerr terms

$$\begin{cases} \frac{\partial A}{\partial t} = \left[-\alpha_1 - i\Delta - i\eta_1 \frac{\partial^2}{\partial \tau^2} + i\gamma_1 |A|^2 + i\gamma_{12} |B|^2 \right] A + iBA^* + S \\ \frac{\partial B}{\partial t} = \left[-\alpha_2 - i2\Delta - d \frac{\partial}{\partial \tau} - i\eta_2 \frac{\partial}{\partial \tau^2} + i\gamma_2 |B|^2 + i\gamma_{21} |A|^2 \right] B + iB^2 \end{cases}$$



The system can be compactly rewritten as:

$$\begin{cases} \frac{\partial A}{\partial t} = \mathcal{L}_1 + \mathcal{Q}_1 + \sigma \mathcal{K}_1(\gamma_1, \gamma_{12}) \\ \frac{\partial B}{\partial t} = \mathcal{L}_2 + \mathcal{Q}_2 + \sigma \mathcal{K}_2(\gamma_2, \gamma_{21}) \end{cases}$$



Bifurcations diagrams

$$\begin{cases} \frac{\partial A}{\partial t} = \mathcal{L}_1 + Q_1 + \sigma K_1(\gamma_1, \gamma_{12}) \\ \frac{\partial B}{\partial t} = \mathcal{L}_2 + Q_2 + \sigma K_2(\gamma_2, \gamma_{21}) \end{cases}$$

