Nonlocal Control of Chemical Front Propagation in the Schlögl Model

Julien Siebert [1], *Rhoslyn Coles* [1], *and Eckehard Schöll* [1]
[1]TU Berlin, Institute of Theoretical Physics, Collaborative Research Center SFB 910

We investigate the dynamics of a paradigmatic model of a bistable reaction-diffusion system (known as the Schlögl model) under the effect of a non-local or time-delayed distributed noninvasive control.
The system without control is known to exhibit a traveling front joining the two stable steady states, which is stable and travels in space at a constant velocity.
Noninvasive control means that we do not change the spatially uniform steady states of the system. However, we may change their stability and for some critical control parameters we may obtain new spatial structures (Turing instability, travelling waves).
In this talk, we will present some recent results on the effect of nonlocal spatial control for different spatial integral kernels, and distributed-delay feedback control with various temporal kernels, and show that, depending upon the control parameters, the front may be accelerated, slowed down, or suppressed, or new spatio-temporal patterns may be generated.