Interaction of spatio-temporal structures

Björn Sandstede
Brown University
bjorn_sandstede@brown.edu

Abstract

The focus of this mini-course are spatio-temporal structures in spatially extended dissipative systems. I will give an overview of the dynamical properties of such structures and outline known results and open questions about their interaction when they occupy disjoint but adjacent regions in space. Starting from relatively simple structures, we will build intuition that will help us with understanding more complicated structures with more degrees of freedom. For instance, we will consider the time evolution of a finite collection of stable localized steady states that are well separated and interact through their tails. Another example we will cover are phase modulations of spatially periodic traveling waves. We will build on these examples to discuss the dynamical properties of glued fronts, defects, and spiral waves. In addition to building intuition, I will give an overview of some of the underlying techniques that can be used to analyse the interaction dynamics.