Waves in Excitable Media: Pulses, Spirals and All That (general)

V. Hakim

Laboratoire de Physique Statistique, ENS
24 rue Lhomond, 75231 Paris, France

Wave propagation is an essential aspect of the dynamics of excitable media. In this talk, one-dimensional solitary waves and two-dimensional spirals are discussed. We particularly focus on the free-boundary limit where the propagating excited region is bounded by a sharp interface. We explain our current understanding of different questions such as wave existence, selection, instabilities and drift in an external field and note along the way various unsolved problems.

Excitable Media in 3D: the Scroll Waves (research)

Scroll waves are three dimensional analogs of the two dimensional spiral waves that have been observed in the Belousov-Zhabotinsky medium and are suspected to play a role in ventricular fibrillation (and in Dicty slug motion). Their instabilities and dynamics are discussed based on analytical computations, numerical stability analysis and dynamical simulations.