

Seminář z diferenciálních rovnic se koná v pondělí 30. 9. 2019 od 12 hodin v učebně M5.

Univ.-Prof. Dr. Erika Hausenblas (Montanuniversität Leoben, Rakousko)

The Stochastic Gray Scott system

Abstrakt přednášky:

Reaction and diffusion of chemical species can produce a variety of patterns, reminiscent of those often seen in nature. The Gray Scott system is a coupled equation of reaction-diffusion type, modelling these kinds of patterns. Depending on the parameter, stripes, waves, cloud streets, or sand ripples may appear.

These systems are the macroscopic model of microscopic dynamics. Here, in the derivation of the equation, the random fluctuation of the molecules are neglected. Adding a stochastic noise, the inherent randomness of the microscopic behaviour is modelled. In particular, we add a time homogenous spatial Gaussian random field with a given spectral measure.

In the talk, we present our main result about the stochastic Gray Scott system. In addition, we introduce and explain an algorithm for its numerical approximation by an Operator splitting method. Finally, we present some examples illustrating the dynamical behaviour of the stochastic Gray Scott system.