DEPARTMENT OF APPLIED MATHEMATICS
應 用 數 學 系

The Hong Kong Polytechnic University
Department of Applied Mathematics

Seminar

Spike clusters for the 1D and 2D Gierer-Meinhardt system

by

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Abstract

We consider the 1D and 2D Gierer-Meinhardt system on a bounded, smooth domain with two small diffusivities. We will show the existence of spike clusters (i.e. a pattern with multiple spikes converging to the same point in the limit of the diffusivities tending to zero) in the following settings: (i) interior spike cluster for the Gierer-Meinhardt system with a precursor gradient in 1D and 2D, (ii) boundary spike cluster in 2D. We will also compute the asymptotic behaviour of the eigenvalues of the system linearised around a spike cluster and show that spike clusters can be stable. These spike clusters play an important role in biological modelling to account for the bridging of lengthscales, e.g. between genetic, nuclear, intra-cellular, cellular and tissue levels, or for the time-hierarchy of biological processes, e.g. a large-scale structure, which appears first, induces patterns on smaller scales. This is joint work with Weiwei Ao, Wen Yang and Juncheng Wei.

Date : 7 September, 2017 (Thursday)
Time : 9:00a.m. – 10:00a.m.
Venue : TU717, The Hong Kong Polytechnic University

*** * * ALL ARE WELCOME * * ***