東北大学大学院情報科学研究科
純粋・応用数学研究センター

情報数理談話会のお知らせ

日　時：　2021年6月28日(月) 13:00より14:00まで
場　所：　Google Meetによりオンラインで開催
※参加方法はホームページをご覧下さい

講演者：　Putri Zahra Kamalia 氏 (東北大学大学院情報科学研究科)
題　目：　Patterns with many critical points for some reaction-diffusion equations on topological tori
備　考：　この情報数理談話会は課程博士予備審査会を兼ねています

[概 要] We consider two types of problems for partial differential equations (PDEs) on topological tori.

The first problem concerns a nonlinear reaction-diffusion equation. We study the existence of critical points of the stable nonconstant stationary solutions. We construct two types of topological tori that are geometrically different from each other. The first topological tori are constructed by attaching a finite number of copies of Riemmanian surfaces with nonempty boundary. The Riemannian surfaces, which are initially surfaces of revolution, have undergone a perturbation to deform its axis of rotation into a circular arc. This method allows us to construct the whole tori. The other topological tori are constructed by the regular perturbation of the standard tori. We call them the perturbed tori.

The second problem concerns the first Dirichlet eigenfunction on the upper half of the perturbed tori. We study the existence of the critical points of the first eigenfunction that corresponds to the principal eigenvalue.

On each problem, we locate the critical points explicitly. Moreover, the total number and locations of critical points are highly related to the shape of the topological tori.

ホームページ：https://www.math.is.tohoku.ac.jp/research/colloquium.html