

* Electronic Address: kokubu@math.kyoto-u.ac.jp

¹ Kyoto University

Morse decompositions of global dynamics from image data

Hiroshi Kokubu^{1*}

In experimental studies, changes of spatial patterns are understood as a manifestation of dynamics. However, there is no method that directly connects changes of patterns with dynamics. In this talk, I shall discuss the use of persistent homology as time-series of the time-varying image data in order to extract dynamical information, especially Morse decomposition. I will apply the idea to numerically simulated data of spatial patterns of PDEs, such as the Swift-Hohenberg equation, and show how the persistent homology data can recover the dynamics on the global attractor of the PDE. This is a joint work with Miroslav Kramar (Tohoku U), Marcio Gameiro (USP-Sao Carlos, Brazil) and Hiroe Oka (Ryukoku, Japan).