

Optimal rate of convergence to non-isolated asymptotic profiles for fast diffusion in thin annuli

Goro Akagi (Tohoku University)

Abstract

In this talk, we discuss the optimal rate of convergence to asymptotic profiles of solutions, which vanish in finite time, to the Fast Diffusion Equation posed on bounded domains. Quantitative studies in this direction have developed significantly since the celebrated work of Bonforte and Figalli (2021). However, in most existing results, asymptotic profiles are assumed to be *nondegenerate*, meaning that the linearized operator has a trivial kernel. In fact, such nondegeneracy holds for generic domains. On the other hand, it is well known that least-energy solutions to the Emden–Fowler equation in thin annuli are nonradial. As a consequence, they are degenerate and thus fall outside the scope of previous works. In this talk, inspired by recent work of König and Yu (2024⁺), we establish the optimal convergence rate to such degenerate asymptotic profiles for certain space dimensions. This talk is based on a recent joint work with Norihisa Ikoma (Keio University) and Yasunori Maekawa (Kyoto University).