Scientiae Mathematicae Japonicae Online

BIFURCATIONS WITH MULTI-DIMENSIONAL KERNEL IN A CHEMOTAXIS-GROWTH SYSTEM

Taka-aki Aoki and Koichi Osaki

Received September 30, 2017 ; revised October 26, 2017

Abstract. We study the bifurcation problem for a chemotaxis-growth system with logistic growth in a two-dimensional rectangular domain. We apply the local bifurcation theorem by Ambrosetti and Prodi that does not require one-dimensional degeneration of the linearized operator around trivial solutions. We then obtain bifurcation solutions with two- and three-dimensional degeneration indicating spatially regular nesting patterns.

Key words and phrases. chemotaxis-growth system, Lyapunov-Schmidt reduction, bifurcation, codimension-two bifurcation, codimension-three bifurcation.