Eventual smoothness in a three-dimensional chemotaxis systems with logistic source

Johannes Lankeit

Universität Paderborn, Germany
`johannes.lankeit@math.uni-paderborn.de`

Session: 13. Global existence versus blowup in nonlinear parabolic systems

We prove existence of weak solutions to the chemotaxis system

$$u_t = \Delta u - \nabla \cdot (u\nabla v) + \kappa u - \mu u^2$$
$$v_t = \Delta v - v + u$$

under homogeneous Neumann boundary conditions in a smooth bounded convex domain $\Omega \subset \mathbb{R}^3$, for arbitrary values of $\mu > 0$.

Additionally, we show that, after some time, these solutions become classical solutions, provided that κ is not too large.