



Contribution ID: 641

Type: Oral Presentation

Long-time shadow limit for a reaction-diffusion-ODE system

Thursday, 3 June 2021 11:30 (15 minutes)

This talk is devoted to a problem of model reduction for a class of reaction- diffusion-ODE systems. Such systems of equations arise, for example, in modeling of interactions between cellular processes and diffusing growth factors. Taking into account different time and space scales of the underlying processes leads to singularly perturbed problems. We focus on a shadow limit approximation for systems with the largest diffusion coefficient tending to infinity that is shown to preserve pattern formation mechanisms. We provide a proof of shadow limit in case of very long-time intervals, i.e., time intervals scaled with the diffusion coefficient and tending to infinity for diffusion tending to infinity. In addition to the convergence result, we provide error estimates in terms of a power of the inverse of the diffusion coefficient.

The talk is based on a joint work with Chris Kowall and Andro Mikelic

Time Block Preference

Time Block B (14:00-17:00 CET)

References

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Student Poster Award

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Session Classification: MS24

Track Classification: (MS24 - Invitation Only) Mathematical and computational challenges related to porous media - Special session in memory of Andro Mikelić