



Hauptvortrag/Plenary lecture

Dienstag/Tuesday, 10:30, Wolfgang-Paul-Hörsaal

Domain Decomposition Methods for Heterogeneous Partial Differential Equations

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In this talk I will review some classical PDE models based on domain decomposition to describe complex phenomena in continuum mechanics. Applications will concern environmental problems, cardiovascular flow problems, and problems arising from sport competition.

In environmental applications, heterogeneous PDE models are used to reduce the complexity of the numerical simulation on large scale problems.

The interest in the use of mathematical modelling and numerical simulation in the study of the cardiovascular system (and its inherent pathologies) has greatly increased in the past few years. We will describe the mechanical interaction of blood flow with arterial walls and simulate numerically the complex fluid-structure interaction problem in large arteries.

In sport, mathematical models are often used to try to enhance performances of athletes as well as to improve the design of vehicles that are used in the various disciplines.

More in general, we will highlight the role of interface conditions and Steklov-Poincaré operators in scientific computing.