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Minisymposium on PDE Constrained Optimization

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Abstract

This minisymposium will reflect state-of-the-art methods for the solution of constrained optimization problems where a partial differential equation (PDE) or a system of PDEs appears as an essential part of the constraints. Such optimization problems arise in various applications, e.g., in parameter identification problems, in structural optimization problems, or in optimal control problems. The efficient and robust solution of PDE constrained optimization problems has a strong impact in automotive and aerospace industries and chemical processing as well as in recently emerging technologies in materials and life sciences. The appropriate mathematical treatment of PDE constrained optimization problems requires the integrated use of advanced methodologies from the theory of optimization and optimal control, the theory of PDEs as well as the development and implementation of powerful algorithmic tools from numerical mathematics and scientific computing. In particular, the design of efficient and reliable numerical solution methods requires a fundamental understanding of the subtle interplay between optimization in function spaces and numerical discretization techniques.