

# Sensitivity analysis and optimization for DAEs and PDAEs (P. Barton & L. Petzold)

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Sensitivity analysis is becoming a very important tool when studying differential equations. Some common applications include experimental design, model reduction, and obtaining gradients and Jacobians in control parameterization approaches for dynamic optimization and parameter estimation. Accurate and efficient computation of sensitivities requires tailored strategies that exploit the structure of the problem under consideration. The minisymposium will discuss a number of different approaches that are emerging to address the various manifestations of the sensitivity analysis problem.

In many engineering, science, economic and finance applications, the ultimate purpose of studying a dynamic system is to optimize its performance in some manner. As noted above, sensitivity analysis provides important gradient information for such optimizations. In addition, a number of other computational issues in the optimization of dynamic systems are of current interest. These include the optimization of large-scale and highly constrained systems, on-line optimization algorithms, global and mixed-integer dynamic optimization, and optimization of partial differential-algebraic systems. The minisymposium will address these issues, in particular the impact of sensitivity analysis.