Einladung

Im Rahmen des Schwerpunktskolloquiums „Analysis und Numerik" hält

Herr Professor Dr. Thomas Slawig
(Christian-Albrechts-Universität zu Kiel)

am **Donnerstag**, dem **3. Juli 2014**, einen Vortrag zum Thema:

Methods for Parameter Estimation in Climate Models

Der Vortrag findet um **17.00 Uhr** in Raum **F 426** statt.

Es wird Gelegenheit gegeben, sich vorher (ab 16.30 Uhr)
im Common Center F 441 bei Tee und Kaffee zu treffen.

Alle Interessenten sind herzlich eingeladen.

Andrea Barjasic
Beauftragte für das Kolloquium

Abstract:
We present the application of different optimization methods on parameter estimation problems in 3-D marine ecosystem models. The latter are used for modeling the carbon cycle in global climate simulations. For these models, parameters are usually estimated or optimized for a stable annually periodic solution before they are used in transient, prognostic runs. Simulation of such a stable annual cycle in the coupled system of ocean circulation and marine ecosystem is an iterative procedure that is computationally very costly. Naturally, these high computational costs are growing when simulation-based parameter optimization or model calibration runs are necessary. Each optimization run may need several hundreds of function evaluations. As a consequence, methods to reduce the computational effort in both simulation and optimization are highly desirable. We present two methods here. The first one is based on an Lagrange multiplier approach and simultaneously iterates the state and optimizes the parameters. The second method is based on surrogate models. In this method, the original and computationally expensive fine model is replaced by a so-called surrogate, which is created from a less accurate but computationally cheaper coarse model with a additional correction approach. We present both methods and show numerical results. Moreover, we show how the underlying simulation itself can be accelerated using methods of mathematics and computer science.

(Volkwein)