



DK Talk announcement

Prof. Dr. Axel Klawonn
(Universität Duisburg-Essen)

Wednesday, February 18, 2009, 01:00 p.m., HS 13

„Parallel scalable FETI domain decomposition methods“

Domain decomposition methods are an efficient approach for the solution of elliptic partial differential equations on parallel computers and, within this class of algorithms, Finite Element Tearing and Interconnecting (FETI) methods are among the most severely tested methods. FETI methods have been proven to be very robust for many problems in structural mechanics while still maintaining good parallel scalability. In these methods the original domain is decomposed into nonoverlapping subdomains and the intersubdomain continuity is in general treated by Lagrange multipliers.

In this talk, the algorithmic design of certain FETI methods will be discussed focusing on the construction of parallel scalable domain decomposition methods. Recent theoretical results will be presented which are also valid for subdomains with irregular boundaries as they appear in the use of graph partitioning tools for the decomposition of the original domain. Numerical results illustrate the good parallel scalability properties and performance of FETI methods, an example of the robustness of this approach is shown for the simulation of an anisotropic hyperelastic elasticity problem modelling the stress of an arterial wall.