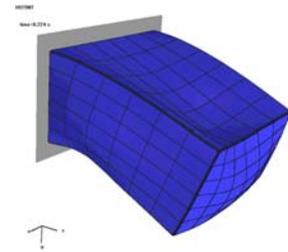
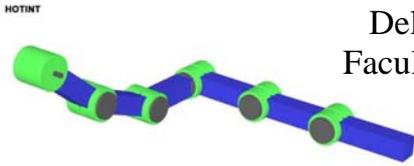


MECHANICS COLLOQUIUM

Monday, November 27, 2006

12:45-13:30 h.

Delft University of Technology
Faculty of Mechanical Engineering
Mekelweg 2, Delft
Room J



“Advanced Methods for Large-Scale Flexible Multibody Systems”

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Abstract - The dynamic simulation of full-scale spatial multibody models of nowadays engineering applications is still not solvable on personal computers in acceptable time. The component mode synthesis method that is based on the floating frame of reference formulation is computationally expensive in the case of a large number of static modes such as due to complex coupling of bodies in the case of contact. An alternative formulation based on absolute coordinates with a reduced strain tensor (similar to corotational formulations) has been derived recently and the analogy to the floating frame of reference formulation has been shown. The efficiency of this formulation is based on a co-rotated mass and stiffness matrix that is factorized only once. A possible modal reduction is shown for this formulation in the planar and linear elastic case, which can reduce the computational costs compared to classical component mode synthesis methods. The proposed methods have been implemented in the research multibody code HOTINT. Some features of the codes such as the numerical solver are outlined in the talk. Numerical examples are shown for a flexible slider-crank mechanism and other typical multibody systems.

About the speaker - Dr. Gerstmayr is currently a post doctoral fellow at the Institute for Technical Mechanics, Johannes Kepler University of Linz, Austria, working on Dynamics of Flexible Multibody Systems with Non-Classical Constraints. He has his degrees from Linz, Diploma thesis (1997) and Doctoral thesis (2001) where he worked on Structural Dynamics of Elasto-Plastic Multibody Systems under Prof. U. Langer and Prof. H. Irschik. He is interested in Continuum Mechanics, Multibody Dynamics and Finite Element Methods. During his post doctoral fellowship he has spend some time at the University of Illinois at Chicago with Prof. Ahmed Shabana and at Instituto Superior Technico, Lisbon, with Prof. Jorge Ambrosio. <http://tmech.mechatronik.uni-linz.ac.at/staff/gerstmayr.en.html> or Google: “gerstmayr”
Local host is Arend Schwab.

