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A. Bohn Product Development and Machine Elements pmd, TU Darmstadt, Germany  
P. Groche Production Engineering and Forming Machines, TU Darmstadt, Germany,  
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H. Klobertanz Product Development and Machine Elements pmd, TU Darmstadt, Germany  
U. Lorenz Mathematical Optimization, TU Darmstadt, Germany  
P. Pelz Fluid Systems Technology, TU Darmstadt, Germany  
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S. Ulbrich Mathematical Optimization, TU Darmstadt, Germany

#### International Scientific Committee

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G. Diana Dipt. di Meccanica, Politecnico di Milano, Italy  
P. Göransson Dept. of Aeronautics and Vehicle Engineering Royal Institute of Technology, Sweden  
E. Macha Dept. of Mechanics and Machine Design, Technical University of Opole, Poland  
A. Plummer Dept. of Mechanical Engineering, Centre for Power Transmission and Motion Control University of Bath, UK

#### Conference Fee

- Registration by October 31, 2011 at [www.icume.de](http://www.icume.de)  
Regular € 500,-  
Student € 300,-  
Fee includes proceedings (hardcopy and online internet access), receptions, lunch, coffee breaks, dinner and excursion.

#### Contact

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SFB 805



Control of Uncertainty in Load-Carrying Structures in Mechanical Engineering

Funded by



Deutsche  
Forschungsgemeinschaft

Final Program

# ICUME 2011

## 1<sup>st</sup> International Conference on Uncertainty in Mechanical Engineering



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

November 14 – 15, 2011 – Congress Centre Darmstadtium  
Technische Universität Darmstadt – Darmstadt, Germany



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#### About ICUME 2011

ICUME discusses methods and technologies to describe, evaluate and control uncertainty in mechanical engineering applications. International scholars and specialists come together to provide a broad forum to discuss the description, evaluation, avoidance, elimination of and adaptation to uncertainty. It is the aim to control uncertainty throughout the system's complete lifetime in planning, development, production and usage of mechanical structures and systems. Engineers, mathematicians and other areas of expertise working in uncertainty evaluation exchange latest research results and application of uncertainty control.

The German Collaborative Research Centre SFB 805 at Technische Universität (TU) Darmstadt, funded by the Deutsche Forschungsgemeinschaft DFG since January 2009, hosts the first International Conference on Uncertainty in Mechanical Engineering – ICUME in Darmstadt, Germany.

ICUME 2011 is a single session conference where all presented papers have been peer reviewed. The proceedings are published in the Journal of Applied Mechanics and Materials.



**Final Program (valid November 10, 2011)****Sunday, November 13, 2011**

12:00 – 16:00	Excursion to the Mathildenhöhe and Grube Messel – free guided tour for participants of ICUME
18:00 – 20:00	Arrival, Registration, Welcome Reception

**Monday, November 14, 2011**

09:00	Arrival, Registration
09:30	Welcome Speech, H. Hanselka (TU Darmstadt)
09:45	Keynote: SFB 805 – Control of uncertainty in load-carrying structures in mechanical engineering, H. Hanselka (TU Darmstadt)
10:30	Behaviour prediction framework in system architecture development K. Osman, M. Štorga, T. Stanković and D. Marjanović (FMENA Zagreb)
10:55	A second order approximation technique for robust shape optimization A. Sichau and S. Ulbrich (TU Darmstadt)
11:20	Coffee Break
11:45	Approaches for assessment of non-determinism in different stages of engineering product design using finite element analysis D. Vandepitte and D. Moens (K.U. Leuven)
12:10	An approach to classify methods to control uncertainty in load-carrying structures R. Engelhardt, J.F. Koenen, M. Brenneis, H. Kloberdanz and A. Bohn (TU Darmstadt)
12:35	Time-dependent fuzzy stochastic reliability analysis of structures W. Graf and J.U. Sickert (TU Dresden)
13:00	Lunch
14:30	Ontology-based information model for the exchange of uncertainty in load carrying structures A. Sprenger, M. Haydn, S. Ondoua, L. Mosch and R. Anderl (TU Darmstadt)
14:55	An approach of design methodology and tolerance optimization in the early development stage to achieve robust systems P. Steinle and M.J. Bohn (Daimler AG)
15:20	Influence of tolerances on mechatronic comfort systems behavior F. Wuttke and M.J. Bohn (Daimler AG)
15:45	Coffee Break
16:10	Control of uncertainties in metal forming by applications of higher flexibility dimensions M. Kraft, S. Calmano, S.O. Schmitt, P. Groche, U. Lorenz and T. Ederer (TU Darmstadt)
16:35	Early stage geometrical deviation optimization – an automotive example for sheet metal parts M.J. Bohn, P. Steinle and F. Wuttke (Daimler AG)
17:00	Methods for the control of uncertainty in multilevel process chains using the example of drilling/reaming M. Haydn, T. Hauer and E. Abele (TU Darmstadt)
17:25	Closing Remarks, H. Hanselka (TU Darmstadt), End of Technical Sessions First Day
19:30	Dinner at the Justus-Liebig-Haus

**Tuesday, November 15, 2011**

08:00	Arrival
08:30	Welcome Speech, R. Platz (Fraunhofer LBF)
08:45	Keynote: Regular and chaotic dynamics of structural members J. Awrejcewicz (Lodz University of Technology)
09:30	Integration of smart materials by incremental forming M. Brenneis, M. Türk and P. Groche (TU Darmstadt)
09:55	Fatigue life estimation under cyclic loading including out-of-parallelism of the characteristics M. Kurek and T. Łagoda (Opole University of Technology)
10:20	Coffee Break
10:45	Approach for a consistent description of uncertainty in process chains of load carrying mechanical systems T. Eifler, G.C. Enss, M. Haydn, L. Mosch, R. Platz and H. Hanselka (TU Darmstadt)
11:10	Assessment of uncertainty for structural and mechatronics engineering applications S. Donders, L. Farkas, M. Hack, H. Van der Auweraer, R. d'Ippolito, D. Moens, and W. Desmet (LMS)
11:35	Uncertainties with respect to active vibration control P.F. Pelz, T. Bedarff and J. Mathias (TU Darmstadt)
12:00	Lunch
13:30	Effect of suspension parameter uncertainty on the dynamic behaviour of railway vehicles L. Mazzola and S. Bruni (Politecnico di Milano)
13:55	Evaluation and control of uncertainty in using an active column system J.F. Koenen, G.C. Enss, S. Ondoua, R. Platz, and H. Hanselka (TU Darmstadt)
14:20	Influence of the selected fatigue characteristics of the material on calculated fatigue life under variable amplitude loading A. Kurek and A. Nieslony (Opole University of Technology)
14:45	Closing Remarks, H. Hanselka (TU Darmstadt)
15:00	End of Conference

**Scientific Scope**

During its life cycle, each engineering product passes different phases during the process of planning, product development, production and usage. Uncertainty occurs in all these phases and thus decisively influences processing properties and thereby product properties.

The Organizing Committee of the first International Conference on Uncertainty in Mechanical Engineering – ICUME is pleased to present several works from an international community and from the SFB 805 members giving an academic and industrial perspective to describe, evaluate and to control uncertainty in:

- 1 Development
- 2 Production and
- 3 Usage.