

# Table of Contents

## Preface and Committees

## 1. Uncertainty in Development

<b>Behaviour Prediction Framework in System Architecture Development</b> K. Osman, M. Štorga, T. Stanković and D. Marjanović	3
<b>A Second Order Approximation Technique for Robust Shape Optimization</b> A. Sichau and S. Ulbrich	13
<b>Approaches for Assessment of Non-Determinism in Different Stages of Engineering Product Design Using Finite Element Analysis</b> D. Vandepitte and D. Moens	23
<b>An Approach to Classify Methods to Control Uncertainty in Load-Carrying Structures</b> R. Engelhardt, J.F. Koenen, M. Brenneis, H. Kloberdanz and A. Bohn	33
<b>Time-Dependent Fuzzy Stochastic Reliability Analysis of Structures</b> W. Graf and J.U. Sickert	45
<b>Ontology-Based Information Model for the Exchange of Uncertainty in Load Carrying Structures</b> A. Sprenger, M. Haydn, S. Ondoua, L. Mosch and R. Anderl	55
<b>An Approach of Design Methodology and Tolerance Optimization in the Early Development Stage to Achieve Robust Systems</b> P. Steinle and M. Bohn	67

## 2. Uncertainty in Production

<b>Influence of Tolerances on Mechatronic Comfort Systems Behavior</b> M. Bohn and F. Wuttke	75
<b>Control of Uncertainties in Metal Forming by Applications of Higher Flexibility Dimensions</b> P. Groche, M. Kraft, S. Schmitt, S. Calmano, U. Lorenz and T. Ederer	83
<b>Early Stage Geometrical Deviation Optimization – An Automotive Example for Sheet Metal Parts</b> M. Bohn, P. Steinle and F. Wuttke	95
<b>Methods for the Control of Uncertainty in Multilevel Process Chains Using the Example of Drilling/Reaming</b> M. Haydn, T. Hauer and E. Abele	103
<b>Integration of Smart Materials by Incremental Forming</b> M. Brenneis, M. Türk and P. Groche	115

## 3. Uncertainty in Usage

<b>Fatigue Life Estimation under Cyclic Loading Including Out-of-Parallelism of the Characteristics</b> M. Kurek and T. Łagoda	125
<b>Approach for a Consistent Description of Uncertainty in Process Chains of Load Carrying Mechanical Systems</b> T. Eifler, G.C. Enss, M. Haydn, L. Mosch, R. Platz and H. Hanselka	133
<b>Assessment of Uncertainty for Structural and Mechatronics Engineering Applications</b> S. Donders, L. Farkas, M. Hack, H. Van der Auweraer, R. d’Ippolito, D. Moens and W. Desmet	145
<b>Uncertainties with Respect to Active Vibration Control</b> P.F. Pelz, T. Bedarff and J. Mathias	161
<b>Effect of Suspension Parameter Uncertainty on the Dynamic Behaviour of Railway Vehicles</b> L. Mazzola and S. Bruni	177

**Evaluation and Control of Uncertainty in Using an Active Column System**

J.F. Koenen, G.C. Enss, S. Ondoua, R. Platz and H. Hanselka

187

**Influence of the Selected Fatigue Characteristics of the Material on Calculated Fatigue Life under Variable Amplitude Loading**

A. Niesłony and A. Kurek

197