



## Scientific and technical organization

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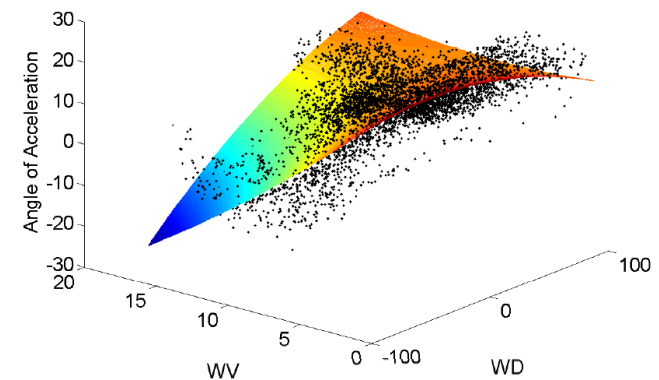


GRK1462  
Summer School

## Uncertainty in Modeling

5<sup>th</sup> - 7<sup>th</sup> September, 2016  
Weimar, Germany

[www.uni-weimar.de/grk1462](http://www.uni-weimar.de/grk1462)



# Uncertainty in Modeling

Modeling is an integral part of most engineering disciplines. There is a broad wealth of modeling techniques that can be considered; the model selection depends on several factors, such as the objective of the analysis and the knowledge about the structure.

However, no matter how elaborate a modeling technique could be, uncertainties in modeling are always present due to the variation of structural parameters. Hence, it is useful to develop methods for assessing the quality of the selected models, using the response data from structures. Moreover, drawing from the theory of structural mechanics, there is strong interaction between the models. Therefore, the coupling quality between the models is also an important matter.

The uncertainty of current modeling techniques is the main focus of the summer school. The terminology covers the following topics:

- Modeling uncertainty in civil and structural engineering;
- Modeling uncertainty in materials science;
- Models in structural health monitoring;
- Reliable infrastructures;
- Model calibration, verification and validation;
- Model updating and optimization;
- Assessment of modeling quality and of data quality;
- Model coupling and coupling uncertainty.

## Monday, 5<sup>th</sup> Sept. 2016

|               |   |
|---------------|---|
| 9:00 - 9:15   | Opening<br>Uncertainty propagation using polynomial chaos expansion<br><b>B. Sudret</b>   |
| 10:30 - 11:00 | Communication break<br>Uncertainty quantification platform UQLab<br><b>B. Sudret</b>  |
| 11:00 - 12:30 | Lunch break<br>Model Calibration, Validation and Uncertainty Quantification in Scientific Computing<br><b>Sez Atamturktur</b>         |
| 13:30 - 15:00 | Communication break<br>Model Calibration, Validation and Uncertainty Quantification in Scientific Computing<br><b>Sez Atamturktur</b> |
| 15:00 - 15:30 | Communication break<br>Model Calibration, Validation and Uncertainty Quantification in Scientific Computing<br><b>Sez Atamturktur</b> |
| 15:30 - 17:00 | Communication break<br>Model Calibration, Validation and Uncertainty Quantification in Scientific Computing<br><b>Sez Atamturktur</b> |
| 17:00         | <i>Sightseeing tour Weimar</i>  |

## Tuesday, 6<sup>th</sup> Sept. 2016

|               |  |
|---------------|--|
| 9:00 - 10:30  | Adaptive surrogate modelling in the context of structural reliability<br><b>J.M. Bourinet</b>                        |
| 10:30 - 11:00 | Communication break<br>Application of the Bootstrap Method for Optimal Sensor Location<br><b>R. Hölder</b>           |
| 11:00 - 12:30 | Uncertainty Modeling and Reliability Analysis for Real-Time Predictions in Mechanized Tunneling<br><b>S. Freitag</b> |
|               | Lunch break  |
| 13:30 - 19:00 | <b>Excursion</b>   |
| 19:00         | <i>Summer School Dinner</i>  |

## Wednesday, 7<sup>th</sup> Sept. 2016

|               |   |
|---------------|---|
| 9:00 - 10:30  | Treatment of epistemic uncertainties with OpenCOSSAN and COSSAN-X<br><b>M. Broggi</b>                                 |
| 10:30 - 11:00 | Communication break<br>Dynamic characterization of slender repetitive structures<br><b>M. Brun</b>                    |
| 11:00 - 12:30 | Lunch break<br>Computational Methods for Fractures and Application to the Design of New Materials<br><b>X. Zhuang</b> |
| 13:30 - 15:00 | Communication break<br>...  |
| 15:00 - 15:30 | Communication break<br>...  |
| 15:30 - 17:00 | Communication break<br><b>Sh. Chowdhury</b><br><b>R. Khosravian</b>   |
| 17:00         | <i>Closing</i>  |

A technical excursion is planned to visit outstanding civil engineering structures in Thuringia.

