



### Location

University of Technology Vienna, Institute of Mechanics and Mechatronics, Wiedner Hauptstrasse 8 – 10, 1040 Vienna, Austria

A detailed list of nearby accommodation, a description of the location and hints for travel will be mailed to the participants upon registration. Please make your own hotel accommodation.

### Fee

EUR 1.050,-

Please pay by non-cash means after receiving the invoice.

CCG is a non profit organisation, exempt from value-added tax.

Members of CCG receive a 10 % discount and students a 75 % discount when they present their student card. If several employees from a company/department are registered for the same seminar, each participant receives a 10 % discount. The discounts cannot be combined.

### Registration

Please write or call (up to 14 days before the seminar) to Carl-Cranz-Gesellschaft e.V.: Postfach 11 12, D-82230 Wessling  
Tel. +49 (0) 8153 / 88 11 98 -12, Fax -19, E-Mail: [anmelden@ccg-ev.de](mailto:anmelden@ccg-ev.de)  
Internet: [www.ccg-ev.de](http://www.ccg-ev.de)

After receipt of registration, a confirmation letter will be sent.

### Further Information

If you would like more information about organization please do not hesitate to contact the CCG at Oberpfaffenhofen at the phone number given above.

If you need more information on the content of the seminar please contact

Prof. Dr. Peter Lugner  
University of Technology Vienna, Institute of Mechanics  
A – 1040 Vienna  
Tel. +43 (0) 1 / 58801-32511, Fax -32599  
E-Mail: [p.lugner@tuwien.ac.at](mailto:p.lugner@tuwien.ac.at)

### Substitutions and Cancellations

Substitutions may be made at any time. Cancellation of an accepted registration made up to 7 days prior to the start of the seminar is subject to EUR 25,- administrative fee. Participants canceling after that date are responsible for the entire seminar fee.



### Who Should Attend

Scientists, researchers and engineers of industry and academic institutions and doctoral and diploma students that are interested in tire modeling or need to use tire characteristics for their investigations

### Focus

Four of the today best known and commercially applied tire characteristics approximations (TMeasy, FTire, RMOD-K, SWIFT) will be presented by their original authors: theoretical background, parameterization and adaptation based on measurements and corresponding software presentations.

By the acquired knowledge the participants should be able to evaluate the efficient application of the tire models. Moreover the detailed information of the tire characteristics could be very helpful for the interpretation of vehicle dynamics simulation results.

### Language

English

### Course Book

Each attendant will be provided with detailed course material in English.



### Seminar TV 4.08

## Tyre Models in Vehicle Dynamics: Theory and Application

September 20 – 21, 2010  
Vienna

### Scientific Coordination

Prof. Dr. Peter Lugner  
University of Technology, Vienna

## Seminar Outline

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### Monday, September 20, 2010 08.45 – 17.00

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08.45 – 09.00 P. Lugner	Welcome and organization
09.00 – 09.30 P. Lugner	Introduction
09.30 – 10.30 W. Hirschberg G. Rill	TMeasy: A semi-physical tire model for vehicle dynamics and handling analyses • Overall concept of TMeasy, range of application • Modeling concept • Contact geometry • Overall concept • Wheel load and tipping torque • Generalized tire force
11.00 – 12.30 W. Hirschberg G. Rill	Self aligning and turn torque • First order tire dynamics • How to apply TMeasy • Estimation of the TMeasy parameters • Uncertainty of measurement data • User roads • Examples of application
13.30 – 15.00 M. Gipser	FTire: a physically based tire model for handling, ride, and durability investigations • Range of application • Modelization and model data • Numerics and implementation aspects • Operating conditions • Model extensions: temperature model, tread wear model etc. • Road model interfacing • RGR roads and soft soil modeling • Availability of FTire in commercial MBS software packages • Validation examples
15.30 – 17.00 M. Gipser	Tools for FTire: FTire/fit (parameter fit on basis of time-domain measurements, including cleat tests) • FTire/calc (parameter computation based upon tire design data) • Fast static and steady-state analysis • Modal analysis of unloaded and loaded tire • Linearization • Demonstration of FTire and its tools

### Tuesday, September 21, 2010 09.00 – 17.00

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09.00 – 10.30 H. B. Pacejka I. Besselink	Different approaches in tyre modelling • The Magic Formula steady-state force and moment model • Tyre dynamics up to 60-100 Hz • Short wavelength obstacle enveloping • Model validation • Recent developments
11.00 – 12.30 H. B. Pacejka I. Besselink	Measurements and parameter identification • Demonstration of MF-Tool 6.1 • Availability, usage and applications of the MF-Tyre/MF-Swift 6.1 model
13.30 – 15.00 Ch. Oertel	Basics of tangential contact dynamics, eigensystem of contact, contact modes, numerical aspects • Tyre model RMOD-K RB with rigid belt dynamics, fields of application and MBS interfaces, application examples • RMOD-K DataManager, a system for determination of model parameters, validation and sensitivity analysis
15.30 – 17.00 Ch. Oertel	Extensions to flexible belt models • Principles of modeling flexible structures by discrete or FE techniques, fields of application, limitations. RMOD-K FB model with flexible belt dynamics, contact dynamics and extensions to misuse • Applications from steady state to short wavelength transient behavior including modeling of obstacles, measurement and preprocessing of real proofing ground surfaces

### Lecturers

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I.J.M. Besselink	Dr.	Eindhoven University of Technology (NL)
M. Gipser	Prof. Dr.	Esslingen University of Applied Sciences (D)
W. Hirschberg	Prof. Dr.	Graz University of Technology (A)
P. Lugner	Prof. Dr.	University of Technology, Vienna (A)
Ch. Oertel	Prof. Dr.	Brandenburg University of Applied Sciences (D)
H.B. Pacejka	Prof. Dr.	Delft University of Technology (NL)
G. Rill	Prof. Dr.	Regensburg University of Applied Science (D)