

Task Force on Tyre Abrasion

## Participating in the TF TA test campaign with the indoor drum method

**Institute of Automotive Engineering, Graz University of Technology**

**Michael Peter Huber**, Research Engineer Non-Exhaust Emissions 

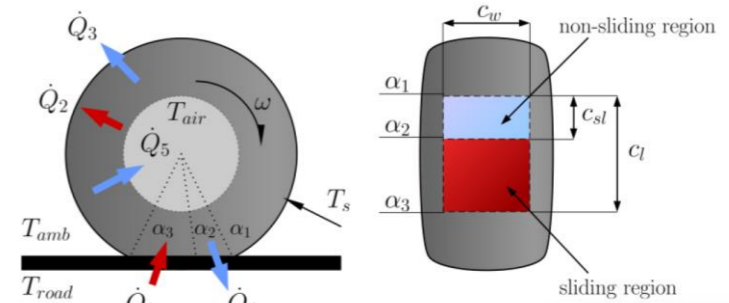
Prof. Peter Fischer, Director

Prof. Cornelia Lex, Tire modeling & testing

# Background – related research focus

## Tires & tire modeling – research focus

- Online estimation of the tire-road friction
- Tire modeling, parameterization & measurements
- Wear homologation for karting tires (upcoming 2023)



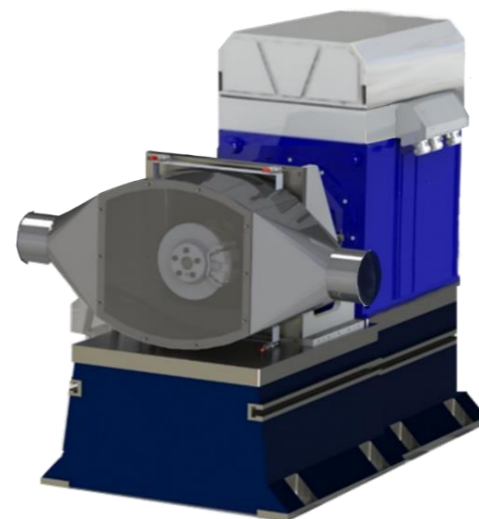
## Transferring driving profiles/cycles to the test bench environment

- Chassis and brake testing with high performance customer cycles



## Brake wear emissions

- Real-driving emissions (RDE)
- GTR brake emissions (brake dyno)



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**Scientific interest – related to research focus**

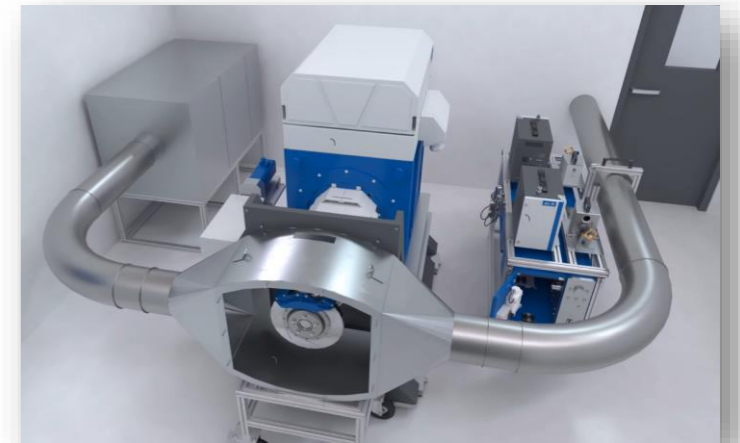
2

**Develop meaningful tire wear standards**

3

**Outlook tire emissions**

- Emission measurement beyond wear
- Identify share of airborne PM on total wear
- Development of tire wear emission measurement equipment



# Typical workflow

## Load collectives provided by partners

- Collected on-road with measuring rim
- Wheel forces and moments ( $F_{x-z}$ ,  $M_{x-z}$ )
- Steering angles, velocity, drive torque, brake pressure, vertical travel

## Load collectives transferred to dyno

- Control parameters adjusted iteratively
- Testing

drum  $\varnothing$  1.2m, plasma coated metallic-porous surface, no gumming, reproduceable wear, constant cooling flow, surface scanning



# Contribution to TF TA

- 1 **Participating in the drum method**
- 2 **Establish correlation between all three test methods**
- 3 **Potential to transfer on-road wear tests to indoor method**  
long term goal (public interest/perception)
- 4 **Comparison between drum sizes**  
more commonly available; similar and/or repeatable results?
- 5 **Comparison between total wear and airborne PM**  
PM10, PM2.5, PN, size distribution

# Remarks

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## Open questions on driving cycles

- Collected data transferred to dyno
- Provide cycle data?

## Specifications of the test methods


- No de-gumming with powder for emission testing
- Drum size
- Constant cooling flow

## Planned test volume for participating labs

- Testing just the reference tire + one or two candidate tires?

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## Contact

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