The presentation of the first-year Ph.D. students

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Presentation
2.10. 2013, FME BUT in Brno, Czech Republic
Content

- Introduction
- Master’s thesis
- Dissertation’s thesis
- Other activities
- Teaching and learning activities
- Future work
Introduce myself

Education and academic qualification

- **2008-2011** Bachelor's degree, Brno University of Technology, Faculty of Mechanical Engineering, Mechanical Engineering

- **2011-2013** Master's degree, Brno University of Technology, Faculty of Mechanical Engineering, Institute of Machine and Industrial Design, Mechanical Engineering Design
Name of my master’s thesis

DESIGN OF EXPERIMENTAL STAND FOR THE STUDY OF RAILWAY VEHICLES SANDING

Connected to project TAČR – Research and develop of progressive sanding system for rail vehicle.

Contact between wheel and rail discs

Schematic representation
Stand for the study of railway vehicles sanding

Operating regimes

<table>
<thead>
<tr>
<th></th>
<th>Regime 1</th>
<th>Regime 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hertzian pressure</td>
<td>1 GPa</td>
<td>0.6 GPa</td>
</tr>
<tr>
<td>rolling speed</td>
<td>0 – 20 km/h</td>
<td>20 – 90 km/h</td>
</tr>
<tr>
<td>adhesion coefficient</td>
<td>max 0.7</td>
<td>max 0.7</td>
</tr>
<tr>
<td>slip</td>
<td>max 0.1</td>
<td>max 0.1</td>
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Dissertation’s thesis

Name of my dissertation’s thesis

Friction modification within wheel and rail contact

Friction management

- Low friction
  - Low friction modifiers
  - Lubricants
  - $\mu=0.1$

- Intermediate friction
  - High friction modifiers
  - TOR composite
  - $\mu=0.4$

- High friction
  - Very high friction modifiers
  - Sand
  - $\mu=0.6$

TOR (Top Of Rail) composite

- Reduction of wear, cracks, corrugation and noise
- Intermediate coefficient of friction

→ Aim of thesis: description of the behavior of TOR composite
Other activities

- Modification of optical tribometer for experimental study of lubricant film behavior under transient conditions
- Stand design for IR camera
## Teaching and learning activities

<table>
<thead>
<tr>
<th>Teaching activities</th>
<th>Learning activities</th>
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</thead>
<tbody>
<tr>
<td><strong>Winter semester</strong></td>
<td><strong>9AJ</strong> – in process (English for Doctoral Degree Study)</td>
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<tr>
<td>5KS</td>
<td><strong>9MOP</strong> (Methodologies of Scientific Work)</td>
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<tr>
<td>(Machine Design – Machine Elements)</td>
<td><strong>9VPR</strong> (Research Project and its Manag.)</td>
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<tr>
<td>ZTR</td>
<td><strong>9EHD</strong> (Elastohydrodynamics)</td>
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<tr>
<td>(Tribology)</td>
<td><strong>9EXT</strong> (Experimental Methods in Tribology)</td>
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<td><strong>Summer semester</strong></td>
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<tr>
<td>6KT</td>
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<tr>
<td>(Machine Design – Mechanical Drives)</td>
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<tr>
<td>6KM</td>
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<tr>
<td>(Machine Design – Mechanisms)</td>
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</table>
Future work

- Literature overview
- Research aim/research plan
- Modification of twin-disc machine
- Experiments and analyses
Thank you for your attention

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