Outline of research and educational activities

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Institute of Machine and Industrial Design

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Presentation
12.11. 2014, FME BUT in Brno, Czech Republic

Content

- Scientific and research activities
  - Applied research – Phd thesis
  - Base research
  - Contract research
- Teaching and learning activities

Tribology research group

Section
Transportation

Section
Elastohydrodynamic

Research and Development of System for Top-of-Rail Friction Management in Rail Transport (2014 – 2018)

Alfa
Technologická agentura České republiky

The aim of the project is to develop a complex system that allows active control of adhesion in rail transport by means of top-of-rail application of friction modifier into wheel and rail contact. The system includes a modular dispensing unit, an intelligent system for autonomous control and friction modifier as a component that enables change of contact adhesion.

Lewis, ISBN: 978-1-84569-412-8

Research and Development of System for Top-of-Rail Friction Management in Rail Transport (2014 – 2018)

Research team

Ústav konstruování

prof. Ing. Martin Hartl

- Ing. Milan Omasta, Ph.D.
- Ing. Radovan Galas

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TriboTec

Ing. Michal Vašíček

- Bc. Petr Kejda

VŠCHT

- Ing. Jaroslav Černý, CSc.

The output of the project: ▮ 4 x G ▮ 1 x R ▮ 3 x F

Dissertation thesis

Name of my dissertation thesis: Friction Modification within Wheel-Rail Contact

State of the art

- Heinrich Hertz, 1881
- F. Carter, 1926
- T. Beagley, 1975
- J. Kalousek, 1992
- K. Hou, 1997
- A. Matsumoto, 2002
- D. Eadie, 2006
- D. Eadie, 2008
- S. Lewis, 2013
- W. Wang, 2014

Aim of thesis

The aim of dissertation thesis is the experimental determination of friction modifier components on adhesion in wheel rail contact.

Initial experiment

Research and Development of System for Top-of-Rail Friction Management in Rail Transport (2014 – 2018)

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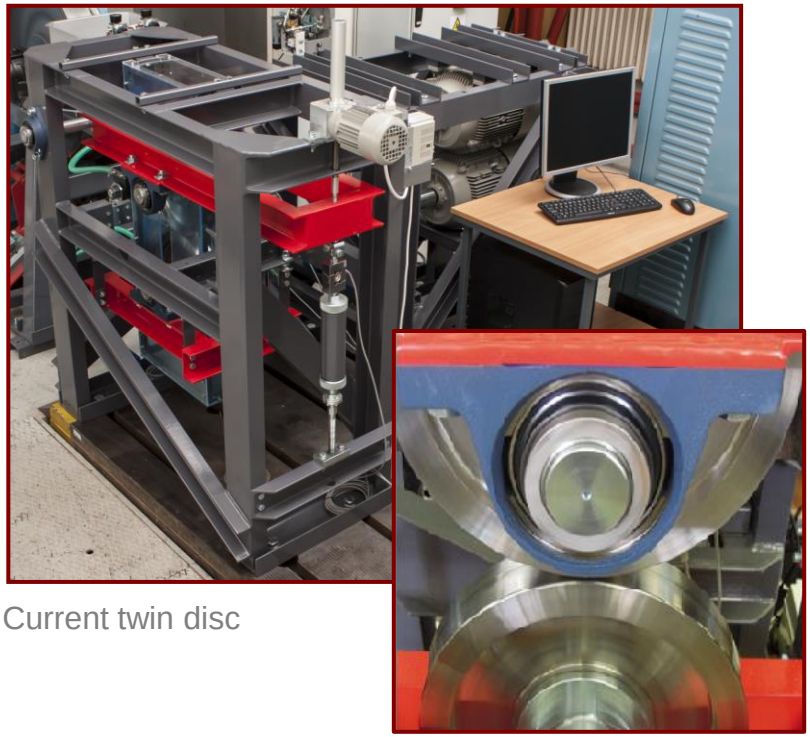
Modification of twin disc machine



Current twin disc

Future twin disc

Through-thickness fluid flow measurement in concentrated contacts (2014 – 2017)

GAČR
GRANTOVÁ AGENTURA ČESKÉ REPUBLIKY

The goal is to develop an experimental approach to the study of through-thickness fluid flow in thin-film lubricated non-conformal contacts. The approach is based on particle tracking velocimetry and ball-on-disk test rig and will be applied to the research of dimple phenomena in EHL.

Research team

- **Ing. Petr Šperka, Ph.D.**
- Ing. Milan Omasta, Ph.D.
- Ing. Radovan Galas
- Ing. Samuel Horňák

The output of the project

- 1 x Jimp
- 1 x D

Teaching and learning activities

Teaching activities

Winter semester

- **5KS**
  (Machine Design – Machine Elements)
- **ZTR**
  (Tribology)
- **ZKP**
  (Team Project)

Summer semester

- **6KM**
  (Machine Design – Mechanisms)

Learning activities

- **9MOP** 
  (Methodologies of Scientific Work)
- **9VPR** 
  (Research Project and its Manag.)
- **9AJ**
  (English for Doctoral Degree Study)
- **9EHD**
  (Elastohydrodynamics)
- **9EXT**
  (Experimental Methods in Tribology)

Thank you for your attention

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