Department of condition monitoring in 2019

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Brno, January 2020

ÚSTAV
KONSTRUOVÁNÍ

CONTENTS

- Chain of command
- Scientific sections
- Publications
- Funding sources
- Research results
- Projects

CHAIN OF COMMAND

Vibro-acoustics brigade

Brigade commander





Employees


PhD students

Non-destructive testing brigade

Brigade commander



Employees

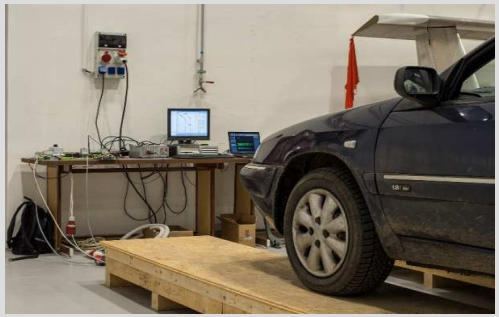

PhD students

SCIENTIFIC SECTIONS

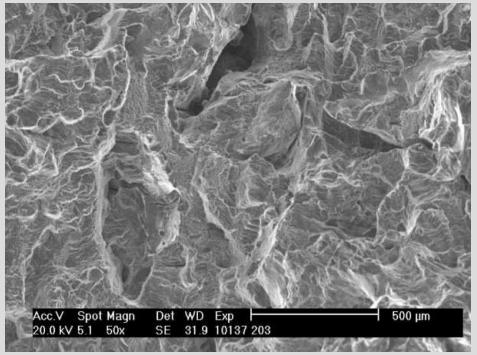
MR technology

Vibro-acoustics

Automotive suspension diagnostics



Non-destructive testing

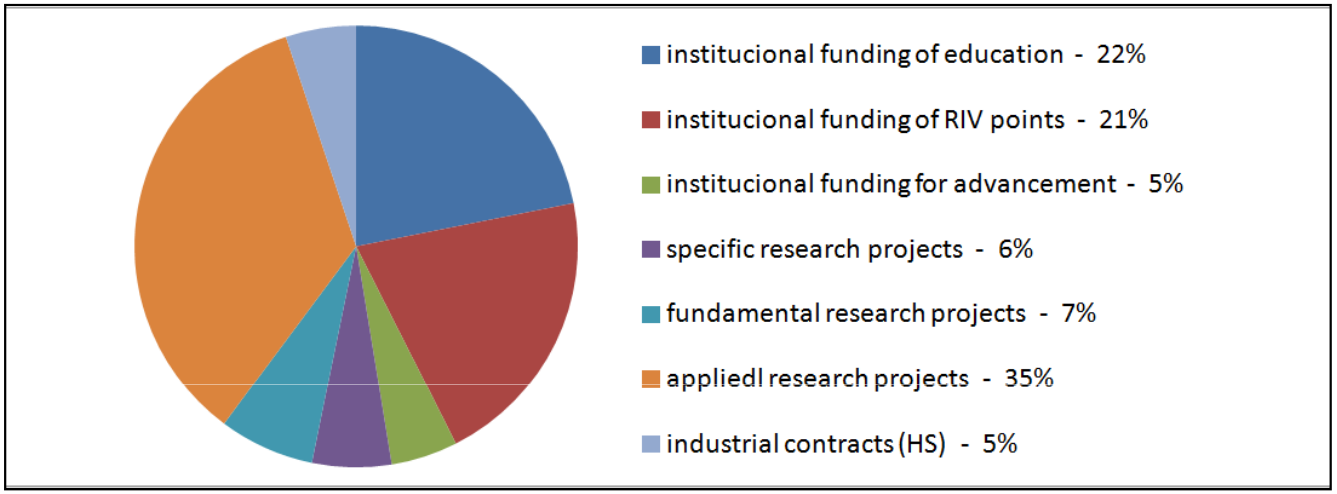


PUBLICATIONS

- **Impact papers (5x)**
  - KUBÍK, M.; PAVLÍČEK, D.; MACHÁČEK, O.; STRECKER, Z.; ROUPEC, J. A magnetorheological fluid shaft seal with low friction torque. Smart Materials and Structures, 2019, roč. 1, č. 28, s. 1-11. ISSN: 1361-665X. (**IF 3.543, Q1, citation: 2**)
  - STRECKER, Z.; KUBÍK, M.; VÍTEK, P.; ROUPEC, J.; PALOUŠEK, D.; ŠREIBR, V. Structured magnetic circuit for magnetorheological damper made by selective laser melting technology. SMART MATERIALS & STRUCTURES, 2019, roč. 28, č. 55016, s. 1-13. ISSN: 0964-1726. (**IF 3.543, Q1, citation:3**)
  - MAHMOUD, H.; MAZAL, P.; VLAŠIC, F. Relationship between acoustic emission signal and loads on pneumatic cylinders. Nondestructive Testing and Evaluation, 2019, roč. 2019, č. 34, s. 1-17. ISSN: 1477-2671. (**IF 1.735, Q2**)
  - KUBÍK, M.;GOLDASZ,J. Multiphysics Model of an MR Damper including Magnetic Hysteresis. SHOCK AND VIBRATION, 2019, roč. 2019, č. 1, s. 1-20. ISSN: 1875-9203. (**IF 1.63, Q3**)
  - MACHÁČEK, O.; KUBÍK, M.; STRECKER, Z.; ROUPEC, J.; MAZŮREK, I. Design of a frictionless magnetorheological damper with a high dynamic force range. Advances in Mechanical Engineering, 2019, roč. 11, č. 3, s. 1-8. ISSN: 1687-8132. (**IF 0.848, Q3**)
- **Conference proceedings (8x)**
  - JENIŠ, F.; ROUPEC, J.; ŽÁČEK, J.; KUBÍK, M.; MACHÁČEK, O.; SMILEK, J.; SMILKOVÁ, M.; MAZŮREK, I. Abrasion of Magnetorheological Fluids. In Engineering Mechanics 2019, 25th International Conference. Praha: Institute of Thermomechanics of the Czech Academy of Sciences, 2019. s. 169-172. ISBN: 978-80-87012-71-0.
  - VLAŠIC, F.; MAZAL, P.; MAHMOUD, H.; SVOBODOVÁ, M. Acoustic Emission Signal Analysis of Steam Piping Materials under Creep Damage Conditions. 15th International Symposium on Nondestructive Characterization of Materials. ASNT, Portorož, Slovenia, 2019. p. 1-11.
  - GOLDASZ, J.; SAPINSKI, B.; JASTRZĘBSKI, Ł.; KUBÍK, M. Applicability of Magnetic Hysteresis Models for Predicting the Behaviour of MR Dampers. 9th ECCOMAS Thematic Conference on Smart Structures and Materials. Paris, 2019.

CAPITAL SOURCES

Total budget in 2019:



Launched and continuing projects in 2019

- GAČR – (Strecker/Roupec)
- TAČR NCK – (JOBNAC - Mazůrek, MESTEC - Klapka)
- TAČR Epsilon – (2 x Mazal, 1 x Mazůrek)
- MPO Trio – (3 x Mazal, 1 x Mazůrek)
- NAWA – (Kubík)
- HS >100K – (1 x Mazůrek, 1 x Klapka, 1 x Mazal, 1 x Roupec)

NEW PROJECTS

New projects in 2020

- GAČR Junior – Study of the magnetorheological fluid response time – (Kubík)
- GAČR Standard – Squeal noise generation in the wheel-rail contact with modified friction – (Klapka, Omasta)
- TAČR Trend – Combined tester for measuring the braking effect and exhaust emissions of a passenger car – ModularTest s.r.o. – (Mazůrek)
- TAČR Trend – Electric drive unit for bus door control – Poličské strojírny a.s. – (Petruška, Mazal)

Podané projekty

- TAČR Doprava 2020 – Low-speed roller dynamometer for emission and brake tests – ModularTest s.r.o. – (Mazůrek) – podáno
- MPO OP PIK – Introduction of the methodology of industrial experiment into the life cycle of ST-OS products – Strojírna Oslavany a.s. – (Mazůrek) – podáno
- TAČR Trend – Magnetorheological dampers for enduro bike with settings via Android – Amulet s.r.o. – (Roupec) – příprava

NAWA EMMAT PROJECT

- Project name: E-mobility and sustainable materials and technologies EMMAT
- International Workshop for EMMAT consortium partners in Brno
- **Participants**:
  - Prof. Goldasz, Poland
  - Prof. Ferreira, Portugal
  - Prof. Martis, Romania
  - Prof. Gabioud, Switzerland

- **Publication**:

- KUBÍK, M.;GOLDASZ,J. Multiphysics Model of an MR Damper including Magnetic Hysteresis. *SHOCK AND VIBRATION,* 2019
- GOLDASZ, J.; SAPINSKI, B.; JASTRZĘBSKI, Ł.; KUBÍK, M. Applicability of Magnetic Hysteresis Models for Predicting the Behaviour of MR Dampers.

ZBYNĚK STRECKER – INTERNSHIP IN CHINA

Publications → interest of prof. Wei -> visit at BUT → Invitation to China (Overseas outstanding talents)

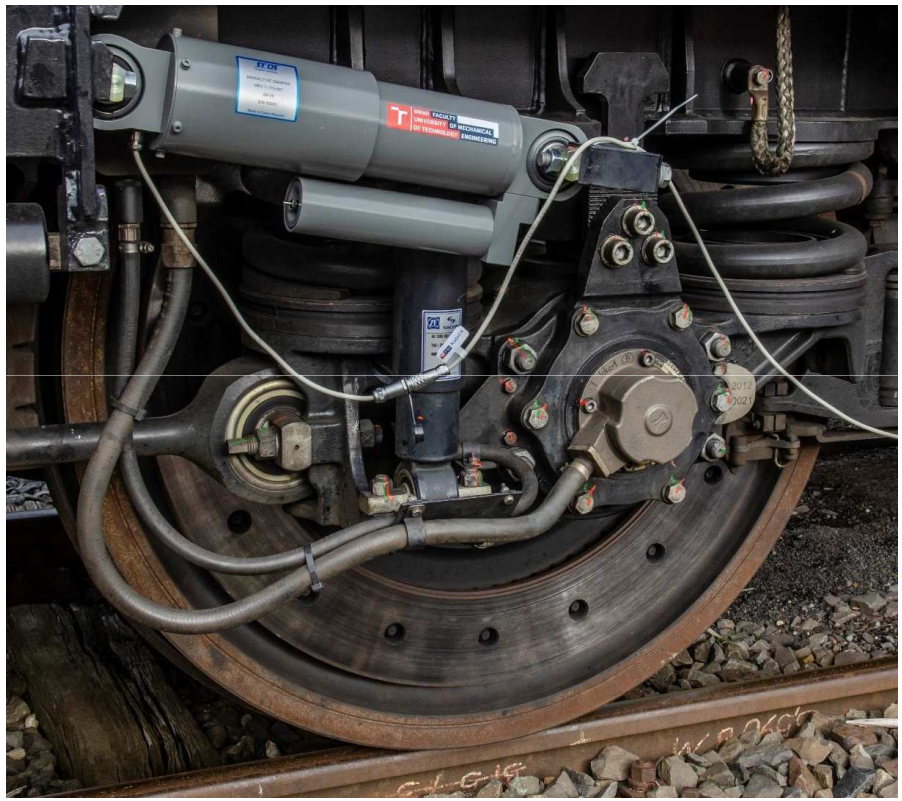
- Duration of internship: 1 month
- Covered costs:
  - Fly tickets
  - Accommodation
  - Scholarship
- New contacts -> joint projects

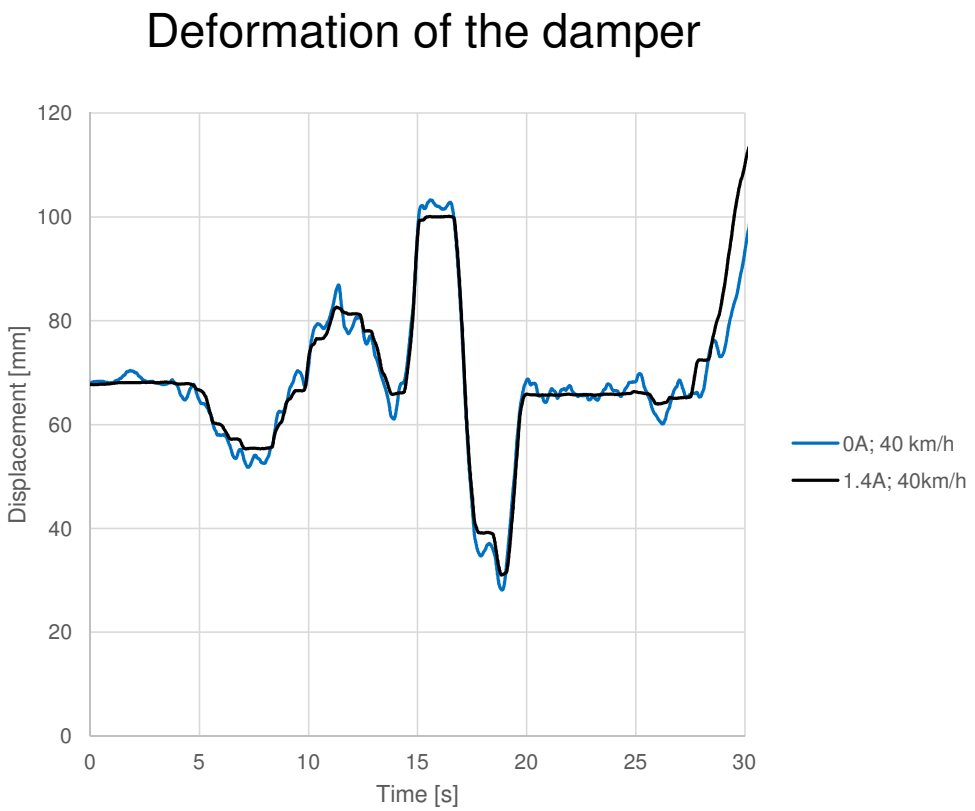
IN-SERVICE TESTS IN MINDEN (GERMANY)

Vehicle: Škoda E109
v = 25; 40 km/h

Test track: Minden, Germany
R 190m

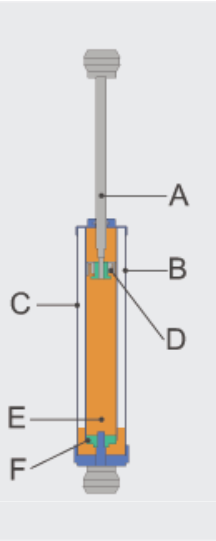
IN-SERVICE TESTS IN MINDEN (GERMANY)



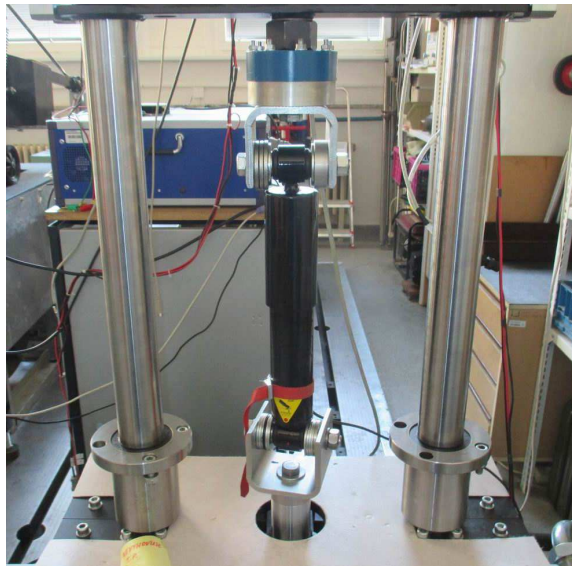


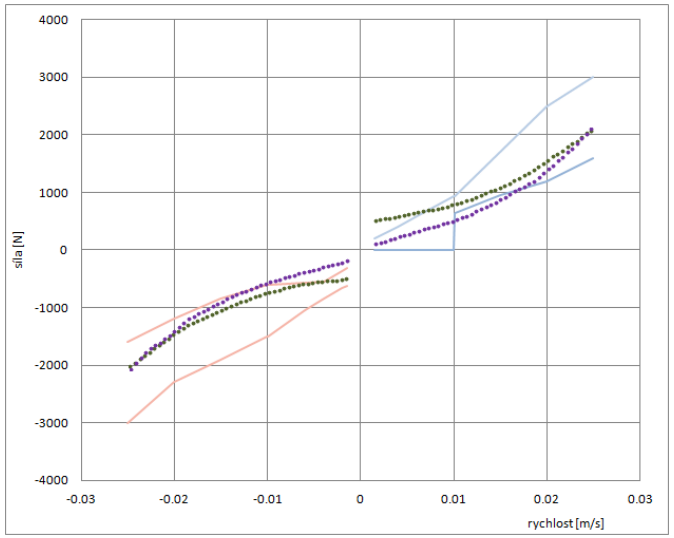
HYDRAULIC SHOCK ABSORBER P50

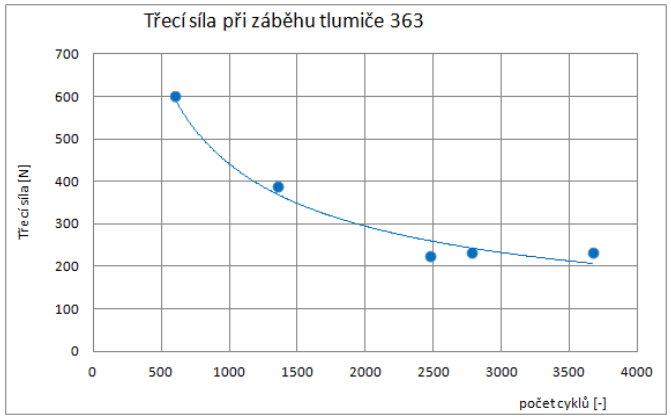
Zkouška	Tlumič	Tření [N]	Poznámka
SVHS_00	-	393	Referenční tlumič SV-shocks
SOHS_00	052358	515	OK, vysoké tření
SOHS_01	052365	248	Upravený, pístní kroužek, velký útlum v tlaku
SOHS_02	052359	504	OK, vysoké tření
SOHS_03	052366	358	Vadný, nestabilní cykly
SOHS_04	052363	601	OK, vysoké tření
SOHS_05	052362	577	Vysoké tření, velký útlum v tlaku
SOHS_06	052367	691	Vadný, nestabilní cykly
SOHS_07	052361	512	OK, vysoké tření
SOHS_08	052364	522	OK, vysoké tření
SOHS_09	052360	472	Vadný, nestabilní cykly



ST-OS strojírna oslavany







SVL (СКОРОСТНОЙ ВАГОН-ЛАБОРАТОРИЯ) – 2 x AI-25 (1971)

THANK YOU FOR ATTENTION

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www.**ustavkonstruovani**.cz