2019 Research-related activities

BUT FCE Institute of Mathematics and Descriptive Geometry

Staff:

Professors	Josef Diblík, Jiří Vala
Associate professors	Irena Hinterleitner, Jiří Novotný, Alena Vanžurová
Assistent professors	Darina Brothánková, Jana Bulantová, Hana Halfarová, Jan Holešovský, Jana Hřebíčková, Veronika Chrastinová, Eva Jansová, Helena Koutková, Karel Mikulášek, Blanka Morávková, Radko Odehnal, Šárka Pechancová, Květoslava Prudilová, Petra Rozehnalová, Rudolf Schwarz, Jana Slaběňáková, Jan Šafařík, Hana Šafářová, Pavel Špaček, Jan Vondra, Lucie Zrůstová
Assistents	Kateřina Pokorová (Konečná), Kristýna Mencáková, Oto Přibyl, Lenka Rýparová
Technical and economic staff	Jarmila Janochová, Alena Vlčková

Papers published in journals:

1. DIBLÍK, J.; DZHALLADOVA, I.; RŮŽIČKOVÁ, M. A dynamical system with random parameters as a mathematical model of real phenomena. *Symmetry* 2019/11, 1–14. ISSN: 2073-8994. IF: 2,143.

2. DIBLÍK, J.; HALFAROVÁ, H.; ŠAFAŘÍK, J. Formulas for the general solution of weakly delayed planar linear discrete systems with constant coefficients and their analysis. *Applied Mathematics and Computation* 358/10 (2019), 363–381. ISSN: 0096-3003. IF: 3,092.

3. DIBLÍK, J.; CHUPÁČ, R.; RŮŽIČKOVÁ, M. Increasing convergent and divergent solutions to nonlinear delayed differential equations. *Differential and Integral Equations* 32/9-10 (2019), 493–516. ISSN: 0893-4983. IF: 0,915.

4. DIBLÍK, J.; KUDELČÍKOVÁ, M.; RŮŽIČKOVÁ, M. Positive solutions to delayed differential equations of the second order. *Applied Mathematics Letters* 94/9 (2019), 52–58. ISSN: 0893-9659. IF: 3,487.

5. HINTERLEITNER, I.; BEREZOVSKI, V.; SMETANOVÁ, D.; CHEREVKO, Y. Infinitesimal transformations of locally conformal Kähler manifolds. *Mathematics* 7/8 (2019), 1–16. ISSN: 2227-7390. IF: 1,105.

6. HINTERLEITNER, I.; MIKEŠ, J.; GUSEVA, N. There are no conformal Einstein rescalings of pseudo-Riemannian Einstein spaces within complete light-Like geodesics. *Mathematics* 7/9 (2019), 1–6. ISSN: 2227-7390. IF: 1,105.

7. POKOROVÁ, K.; HOROVÁ, I. Maximum likelihood method for bandwidth selection in kernel conditional density estimate. Computational Statistics and Data Analysis 34 (2019), 1871–1887. ISSN: 0943-4062. IF: 0,68.

8. VALA, J.; JAROŠOVÁ, P.; KOZÁK, V. On the computational analysis of damage of quasi-brittle materials using integral-type nonlocal models. *International Journal of Applied Physics* 4 (2019), 8–13. ISSN: 2367-9034.

Papers published in conference proceedings:

1. BAŠTINEC, J.; DIBLÍK, J.; HALFAROVÁ, H. Positive solutions of nonlinear discrete equations. *19th Aplimat (Conference on Applied Mathematics)* in Bratislava, 2019, 23–30. Spektrum STU, Bratislava, 2019. ISBN: 978-80-244-5535-8.

2. BULANTOVÁ, J.; LACHOVÁ, A. Topografické plochy v Geogebra. *5. Slovensko-česká konferencia o geometrii a grafike* in Trenčianské Teplice, STU Bratislava, 2019, 63–66. ISBN: 978-80-86843-65-0.

3. HOLEŠOVSKÝ, J. Extrémní hodnoty časových řad a jejich odhady. *12. Matematika na vysokých školách* in Herbertov u Vyššího Brodu, ČVUT a JČMF, Praha, 2019, 55–60. ISBN: 978-80-01-06621-8.

4. MENCÁKOVÁ, K.; ŠAFAŘÍK, J. Topografické plochy v Geogebra. *5. Slovensko-česká konferencia o geometrii a grafike* in Trenčianské Teplice, STU Bratislava, 2019, 63–66. ISBN: 978-80-86843-65-0.

5. PAZDERA, L.; TOPOLÁŘ, L.; DVOŘÁK, R.; HODULÁKOVÁ, M.; PLŠKOVÁ, I.; BÍLEK, V.; MIKULÁŠEK, K. Using modal-parameter-based analysis of the behaviour of alkali-activated material with surface degraded by ultraviolet radiation. *57th EAN (Experimental Stress Analysis)* in Luhačovice, FME BUT and Czech Society for Mechanics, 2019, 378–383. ISBN: 978-80-214-5766-9.

6. TUSCHER, M.; PŘIBYL, O.; HANÁK, T. Influence of Material Composition of Structures on the Accuracy of Flood Loss Evaluation. *12th PBE (People, Building and Environment)* in Brno, 2018. IOP Conference Series 222, Bristol (UK), 2019, #012017/1–6. ISSN:1755-1307.

7. VALA, J. New composite time integration schemes in structural dynamics. *16th ICNAAM (International Conference of Numerical Analysis and Applied Mathematics)* in Rhodes, 2018. AIP Conference Proceedings 2116, Melville (USA), 2018, #310012/1–4. ISBN: 978-0-7354-1854-7. ISSN: 0094-243X.

8. VALA, J. On some composite schemes of time integration in structural dynamics. *19th PANM* (*Programs and Algorithms of Numerical Mathematics*) in Hejnice, 2018. Institute of Mathematics CAS, Prague, 2019, 159–168. ISBN: 978-80-85823-69-1.

9. VALA, J. Remarks to the computational analysis of semilinear direct and inverse problems of heat transfer. *24th Thermophysics* in Smolenice, 2019. AIP Conference Proceedings 2170, Melville (USA), 2019, #20023/1–6. ISBN: 978-0-7354-1917-9. ISSN: 0094-243X.

10. VALA, J.; KOZÁK, V. K možnostem výpočtové predikce kvazikřehkého porušení cementových kompozitů rozšířenou metodou konečných prvků. *18. Maltoviny* in Brno, 2019, FAST VUT, Brno, 2019, 5–13. ISBN 978-80-214-5816-1.

11. VANŽUROVÁ, A. Homothety curvature homogeneous Riemannian manifolds of dimension three. *19th Aplimat (Conference on Applied Mathematics)* in Bratislava, 2019. Spektrum STU, Bratislava, 2019, 213–266. ISBN: 978-80-244-5535-8.

12. VÁŽANOVÁ, G.; DIBLÍK, J. Criteria for existence of solutions to linear advance-delay equations. *6. MITAV (Matematika, informační technologie a aplikované vědy)* in Brno, 2019. Univerzita obrany v Brně, 2019, #VD/1–5. ISBN: 978-80-7582-097-6.

Books:

1. MIKEŠ, J.; VANŽUROVÁ, A.; et al. *Differential Geometry of Special Mappings.* Palacký University (ID 333149718), Olomouc, 2019. ISBN: 978-80-244-5535-8.

Participation in research projects:

1. *AdMaS UP – Advanced Materials, Structures and Technologies*, project LO1408, solution provider D. Novák. MAT: J. Diblík, H. Halfarová, J. Holešovský, J. Vala.

2. *Numerical Analysis by the Extended Method of Finite Elements of Cracks Occurring and Propagating in Quasi-Britle Materials*, project of specific university research FAST-S-19-5878, solution provider J. Vala. MAT: J. Holešovský, J. Vala.

Conferences co-organized:

1. *18th ICNAAM (International Conference on Numerical Analysis and Applied Mathematics)* in Rhodes, 23rd to 28th September 2019, Section No. 56 *Dynamical Systems and Their Applications to Advanced Materials, Structures and Technologies*, section organizer J. Vala.

Doctoral study:

K. Pokorová	supervisor prof. I. Horová	MU SCI in Brno
K. Mencáková	supervisor prof. J. Diblík	BUT FEEC in Brno
O. Přibyl	supervisor doc. J. Raclavský	BUT FCE in Brno
L. Rýparová	supervisor prof. J. Mikeš	UP FS in Olomouc
M. Jedlička (STM)	supervisor prof. J. Vala	BUT FCE in Brno

Brno on 1st April 2020

prof. RNDr. Josef Diblík, DrSc.,
head of MAT institute