

2018 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
Assistant 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 Konečná, Kristýna Mencáková, Oto Příbyl, Lenka Rýparová
Technical and economic staff	Jarmila Janochová, Alena Vlčková

Papers published in journals:

1. DIBLÍK, J. Positive solutions to generalized Dickman equation. *Applied Mathematics Letters* 72/10 (2018), 111–117. ISSN: 0893-9659.
2. DIBLÍK, J. Long-time behaviour of solutions of delayed-type linear differential equations. *Electronic Journal of Qualitative Theory of Differential Equations* 2018, 47 (2018), 1–23. ISSN: 1417-3875.
3. DIBLÍK, J.; MEDINA, R. Exact asymptotics of positive solutions to Dickman equation. *Discrete and Continuous Dynamical Systems – Series B* 72/10 (2018), 101–121. ISSN: 1553-524X.
4. HINTERLEITNER, I.; BEREZOVSKI, V.; MIKEŠ, J. Geodesic Mappings of Manifolds with Affine Connection onto the Ricci Symmetric Manifolds. *Filomat* 32/2 (2018), 379–385. ISSN: 0354-5180.
5. HINTERLEITNER, I.; BEREZOVSKI, V.; GUSEVA, N.; MIKEŠ, J. Conformal Mappings of Riemannian Spaces onto Ricci Symmetric Spaces. *Mathematical Notes* 103/2 (2018), 304–307. ISSN: 0001-4346.

6. HOLEŠOVSKÝ, J. Distribution endpoint estimation assessment for the use in metaheuristic optimization procedure. *Mendel Journal Series* 24/1 (2018), 93–100. ISSN: 1803-3814.
7. HOLEŠOVSKÝ, J.; ČAMPULOVÁ, M.; MICHÁLEK, J. Semiparametric outlier detection in nonstationary times series: Case Study for Atmospheric Pollution in Brno, Czech Republic. *Atmospheric Pollution Research* 9/1 (2018), 27–36. ISSN: 1309-10.
8. CHRASTINOVÁ, V. The incomplete exact inverse problem of the calculus of variations. *Advances in Analysis* 3/1 (2018), 52–65. ISSN: 2518-3680.
9. CHRASTINOVÁ, V.; TRYHUK, V. The symmetry reduction of variational integrals, complement. *Mathematica Bohemica* 143/6 (2018), 601–624. ISSN: 0862-7959.
10. KONEČNÁ, K. The Priestley-Chao estimator of conditional density with uniformly distributed random design. *Statistika* 98/3 (2018), 283–294. ISSN: 1804-8765.
11. NĚMEC, I.; TRCALA, M.; VALA, J.; VANĚČKOVÁ, A. A contribution to analysis of collapse of high-rise building inspired by the collapses of WTC1 and WTC2: derivation of simple formulas for collapse upper speed and acceleration. *Journal of Applied Mathematics and Physics* 6/12 (2018), 2666–2680. ISSN: 2327–2379.
12. RUČKA, J.; HOLEŠOVSKÝ, J.; SUCHÁČEK, T.; TUHOVČÁK, L. An experimental water consumption regression model for typic administrative buildings in the Czech Republic. *Water* 10/424 (2018), 1–20. ISSN: 2073-4441.
13. RŮŽIČKOVÁ, M.; DZHALLADOVA, I.; LAITCHOVÁ, J.; DIBLÍK, J. Solution to a stochastic pursuit model using moment equations. *Discrete and Continuous Dynamical Systems – Series B* 72/10 (2018), p. 473–485. ISSN: 1553-524X.
14. ŠŤASTNÍK, S.; VALA, J.; ŠOT, F. Physical properties of selected silicates for a long-term heat container. *Solid State Phenomena* 276 (2018), 154–159. ISSN: 1662-9779.
15. TRYHUK, V.; CHRASTINOVÁ, V. The symmetry reduction of variational integrals. *Mathematica Bohemica* 143/3 (2018), 291–328. ISSN: 0862-7959.
16. VALA, J. On the implementation of exact solution of a beam on elastic foundation in numerical calculations. *International Journal of Mathematical Models and Methods in Applied Sciences* 12 (2018), 215–219. ISSN: 1998-0140.
17. VALA, J.; JAROŠOVÁ, P. Optimization approaches to some problems of building design. *Applications of Mathematics* 63/3 (2018), 305–331. ISSN: 0862-7940.

Papers published in conference proceedings:

1. DIBLÍK, J.; MENCÁKOVÁ, K. Linear discrete systems of higher-order and conditions of their relative controllability. *5. MITAV (Matematika, informační technologie a aplikované vědy)* in Brno, 2018, #7.3/44–54. Univerzita obrany v Brně, 2018. ISBN: 978-80-7582-040-2.
2. JAROŠOVÁ, P.; VALA, J. Computational optimization of energy consumption in the design of buildings. *16th ICNAAM (International Conference on Numerical Analysis and Applied Mathematics)* in Thessaloniki, 2017. AIP Conference Proceedings 1978, Melville (USA), 2018, #430008/1–4. ISBN: 978-0-7354-1690-1. ISSN: 0094-243X.

3. KONEČNÁ, K. Leave-one-out maximum likelihood method for the Priestely-Chao estimator of conditional density. *17th Aplimat (Conference on Applied Mathematics)* in Bratislava (2017), 115–125. Spektrum STU, Bratislava, 2017. ISBN: 978-80-227-4765-3.
4. HINTERLEITNER, I.; MIKEŠ, J.; GUSEVA, N. On conformal mappings onto compact Einstein manifolds. *17th International Conference on Geometry, Integrability and Quantization*, 2018, 132–139. Bulgarian Academy of Sciences, Sofia, 2018. ISSN: 1314-3247.
5. MENCÁKOVÁ, K. Studijní materiály k předmětu Konstruktivní geometrie. *38. konference o geometrii a grafice* in Blansko, 2018. VUT v Brně, 2018, 153–162. ISBN: 978-80-214-5652-5.
6. NOVOTNÝ, J. Interaktivní výukové materiály. *38. konference o geometrii a grafice* v Blansku (2018). VUT v Brně, 2018, 195–205. ISBN: 978-80-214-5652-5.
7. PAZDERA, L.; TOPOLÁŘ, L.; HODULÁKOVÁ, M.; DVOŘÁK, R.; MIKULÁŠEK, K. Analysis of temperature degraded concrete at high temperature by applying of non-linear characteristics. *21st ICBMPT (International Conference Building Materials, Products and Technologies)* in Blansko-Češkovice. *IOP Conference Series: Materials Science and Engineering* 379, Bristol, 2018. #12036/1-6. ISSN: 1757-8981.
8. ŠTEKBAUER, H.; VLK, Z.; VALA, J. On some implicit numerical integration schemes in structural dynamics. *16th ICNAAM (International Conference on Numerical Analysis and Applied Mathematics)* in Thessaloniki, 2017. AIP Conference Proceedings 1978, Melville (USA), 2018, #430009/1–4. ISBN: 978-0-7354-1690-1. ISSN: 0094-243X.
9. TUSCHER, M.; PŘIBYL, O.; HANÁK, T. Theoretical model for refining flood economic loss modeling in buildings. *16th ICNAAM (International Conference on Numerical Analysis and Applied Mathematics)* in Thessaloniki, 2017. AIP Conference Proceedings 1978, Melville (USA), 2018, #240010/1–4. ISBN: 978-0-7354-1690-1. ISSN: 0094-243X.
10. VALA, J. Computational optimization of material choice for thermal containers of advanced buildings. *17th Aplimat (Conference on Applied Mathematics)* in Bratislava, 2018, 1065–1075. Spektrum STU, Bratislava, 2018. ISBN: 978-80-227-4765-3.
11. VALA, J. On some non-gradient approaches to inverse and optimization problems of thermal transfer. *23rd Thermophysics* in Smolenice (Slovak Republic), 2018. AIP Conference Proceedings 1988, Melville (USA), 2018, #20047/1–6. ISBN: 978-0-7354-1704-5. ISSN: 0094-243X.
12. VALA, J. Optimalizační přístupy k identifikaci fyzikálních vlastností silikátových materiálů. *17. Maltoviny* v Brně, 2018, 5–16. VUT v Brně, 2018. ISBN 978-80-214-5567-2.
13. VANŽUROVÁ, A. On Riemannian metrics of Sekigawa type. *5. MITAV (Matematika, informační technologie a aplikované vědy)* v Brně, 2018, #5.3/1–11. Univerzita obrany v Brně, 2018. ISBN: 978-80-7582-040-2.
14. VANŽUROVÁ, A. Some projective geometry useful in computer reconstruction techniques. *38. konference o geometrii a grafice* in Blansko, 2018, 257–264. VUT v Brně, 2018. ISBN: 978-80-214-5652-5.
15. VÁŽANOVÁ, G.; DIBLÍK, J. Global solutions to mixed-type nonlinear functional differential equations. *5. MITAV (Matematika, informační technologie a aplikované vědy – vybrané publikace)* in Brno, 2018, 44–54. Univerzita obrany v Brně, 2018. ISBN: 978-80-7582-065-5.

Participation in research projects:

1. *AdMaS UP – Advanced Materials, Structures and Technologies*, project LO1408, solution provider D. Novák. MAT: J. Diblík, H. Halfarová, I. Hinterleitner, J. Holešovský, J. Vala.
2. *Properties of selected implicit methods in the dynamics of building structures of building structures*, project of specific research FAST-S-18-5184, solution provider J. Vala. MAT: J. Holešovský, J. Vala.
3. *Simulation model for an assessment of the time load of monotower cranes*, project of specific research FAST-S-18-5286, solution provider V. Motyčka. MAT: O. Příbyl.

Conferences co-organized:

1. Conference on geometry and graphics (38th conference on geometry and graphics and 27th symposium on computer geometry) at Blansko, 10th to 13th September 2018. MAT: J. Slaběňáková, J. Šafařík, J. Vondra.
2. *17th ICNAAM (International Conference on Numerical Analysis and Applied Mathematics)* in Rhodes, 13th to 18th September 2018, Section No. 76 *Dynamical Systems and Their Applications to Advanced Materials, Structures and Technologies*, section organizer J. Vala.

Doctoral study:

E. Jansová	supervisor doc. J. Kalas	MU SCI in Brno (successfully finished 2018)
K. Konečná	supervisor prof. I. Horová	MU SCI in Brno
K. Mencáková	supervisor prof. J. Diblík	BUT FEEC in Brno
O. Příbyl	supervisor doc. J. Raclavský	BUT FCE in Brno
L. Rýparová	supervisor prof. J. Mikeš	UP FS in Olomouc
J. Šafařík	supervisor prof. J. Diblík	BUT FEEC in Brno (successfully finished 2018)

Approved on 1st April 2019 by

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