

List of publications (a version from November 2021)

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Journal articles:

- [23] S. Sysala, E. Hrubešová, Z. Michalec, F. Tschuchnigg: Optimization and variational principles for the shear strength reduction method. *International Journal for Numerical and Analytical Methods in Geomechanics* **45** (2021) 2388-2407. (WoS 2020: IF 4.264, Q1 in Mechanics)
- [22] S. Sysala, J. Haslinger, B. D. Reddy, S. Repin: An abstract inf-sup problem inspired by limit analysis in perfect plasticity and related applications. *M3AS - Mathematical Models and Methods in Applied Sciences* **31** (2021) 1593–1623. (WoS 2020: IF 3.817, Q1 in Math-Applied)
- [21] B. D. Reddy, S. Sysala: Bounds on the elastic threshold for problems of dissipative strain-gradient plasticity. *Journal of the Mechanics and Physics of Solids* **143** (2020) 104089. (WoS 2020: IF 5.471, Q1 in Mechanics)
- [20] J. Haslinger, S. Repin, S. Sysala: Inf-sup conditions on convex cones and applications to limit load analysis. *Mathematics and Mechanics of Solids* **24** (2019) 3331-3353. (WoS 2018: IF 1.791, Q2 in Math-Interdisciplinary)
- [19] M. Čermák, S. Sysala, J. Valdman: Efficient and flexible MATLAB implementation of 2D and 3D elastoplastic problems. *Applied Mathematics and Computation* **355** (2019) 595-614. (WoS 2018: IF 3.092, D1 in Math-Applied)
- [18] S. Sysala, R. Blaheta, A. Kolcun, J. Ščučka, K. Souček, P. Pan: Computation of composite strength by limit analysis. *Key Engineering Materials* **810** (2019) 137-142. (not in WoS)
- [17] S. Repin, S. Sysala, J. Haslinger: Computable majorants of the limit load in Hencky's plasticity problems. *Computer & Mathematics with Applications* **75** (2018) 199-217. (WoS 2018: IF 2.811, D1 in Math-Applied)
- [16] S. Sysala, M. Čermák, T. Ligurský: Subdifferential-based implicit return-mapping operators in Mohr-Coulomb plasticity. *ZAMM* **97** (2017) 1502-1523. (WoS 2018: IF 1.467, Q2 in Math-Applied)
- [15] S. Sysala, M. Cermak, T. Koudelka, J. Kruis, J. Zeman, R. Blaheta: Subdifferential-based implicit return-mapping operators in computational plasticity. *ZAMM* **96** (2016) 1318-1338. (WoS 2018: IF 1.467, Q2 in Math-Applied)
- [14] J. Haslinger, S. Repin, S. Sysala: Guaranteed and computable bounds of the limit load for variational problems with linear growth energy functionals. *Applications of Mathematics* **61** (2016) 527-564. (WoS 2018: IF 0.537, Q4 in Math-Applied)
- [13] J. Haslinger, S. Repin, S. Sysala: A reliable incremental method of computing the limit load in deformation plasticity based on compliance: Continuous and discrete setting. *Journal of Computational and Applied Mathematics* **303** (2016) 156-170. (WoS 2018: IF 1,883, Q1 in Math-Applied)

- [12] M. Cermak, J. Haslinger, T. Kozubek, S. Sysala: Discretization and numerical realization of contact problems for elastic-perfectly plastic bodies. PART II - numerical realization, limit analysis. *ZAMM* **95** (2015) 1348-1371. (WoS 2018: IF 1.467, Q2 in Math-Applied)
- [11] S. Sysala, J. Haslinger, I. Hlaváček, M. Cermak: Discretization and numerical realization of contact problems for elastic-perfectly plastic bodies. PART I - discretization, limit analysis. *ZAMM* **95** (2015) 333-353. (WoS 2018: IF 1.467, Q2 in Math-Applied)
- [10] O. Axelsson, S. Sysala: Continuation Newton methods. *Computers & Mathematics with Applications* **70** (2015) 2621-2637. (WoS 2018: IF 3.092, D1 in Math-Applied)
- [9] M. Cermak, S. Sysala: A TFETI Domain Decomposition Solver for Von Mises Elastoplasticity Model with Combination of Linear Isotropic-Kinematic Hardening. *International Journal of Mechanical and Mechatronics Engineering* **9** (2015) 571-576. (not in WoS)
- [8] M. Cermak, T. Kozubek, S. Sysala, J. Valdman: A TFETI Domain Decomposition Solver for Elastoplastic problems. *Applied Mathematics and Computation* **231** (2014) 634-653. (WoS 2018: IF 3.092, D1 in Math-Applied)
- [7] S. Sysala: Properties and simplifications of constitutive time-discretized elastoplastic operators. *ZAMM* **94** (2014) 233-255. (WoS 2018: IF 1.467, Q2 in Math-Applied)
- [6] R. Blaheta, P. Byczanski, M. Cermak, R. Hrtus, R. Kohut, A. Kolcun, J. Malík, S. Sysala: Analysis of ASPO pillar stability experiment: Continuous TM model development and calibration. *Journal of Rock Mechanics and Geotechnical Engineering* **5** (2013) 124-135. (not in WoS)
- [5] O. Axelsson, R. Blaheta, S. Sysala, B. Ahmad: On the solution of high order stable time integration methods. *Boundary Value Problems* **108** (2013), 22 pages. (WoS 2018: IF 1.637, Q1 in Math-Applied)
- [4] S. Sysala: Application of a modified semismooth Newton method to some elasto-plastic problems. *Math. Comp. Sim.* **82** (2012) 2004-2021. (WoS 2018: IF 1.409, Q2 in Math-Applied)
- [3] J. Malik, S. Sysala: Analysis of geosynthetic tubes filled with several liquids with different densities. *Geotextiles and geomembranes* **29** (2011) 249-256. (WoS 2018: IF 3.972, Q1 in Geosciences-Multidisciplinary)
- [2] S. Sysala: Numerical modelling of semi-coercive beam problem with unilateral elastic subsoil of Winkler's type. *Applications of Mathematics*, **55** (2010) 151-187. (WoS 2018: IF 0.537, Q4 in Math-Applied)
- [1] S. Sysala: Unilateral elastic subsoil of Winkler's type: Semi-coercive beam problem. *Applications of Mathematics*, **53** (2008) 347-379. (WoS 2018: IF 0.537, Q4 in Math-Applied)

Selected conference papers:

- [17] A. Kolcun, S. Sysala: RTIN-based strategies for local mesh refinement. In: J. Chleboun, P. Kus, P. Prikryl, M. Rozložník, K. Segeth, J. Sístek, & T. Vejchodský (Eds.), PANM 20: Proceedings of 20th conference, Programs and Algorithms of Numerical Mathematics, Prague: Czech Academy of Sciences, 2021, pp. 59-68.
- [16] M. Čermák, S. Sysala, J. Valdman: On vectorized MATLAB implementation of elastoplastic problems. AIP Conference Proceedings 2293, 330003 (2020); <https://doi.org/10.1063/5.0026561>

- [15] S. Sysala, J. Haslinger, S. Repin: Limit analysis and inf-sup conditions on convex cones. COMPLAS 2019 - XV International Conference on Computational Plasticity. Fundamentals and Applications. International Centre for Numerical Methods in Engineering (CIMNE), (Oñate, E.; Chiumenti, M.; Owen, R.; Peric, D.; de Souza Neto, E. eds.), 2019, 133-144.
- [14] S. Sysala, J. Haslinger, S. Repin: Reliable computation and local mesh adaptivity in limit analysis. In J. Chleboun, P. Kus, P. Prikryl, M. Rozložník, K. Segeth, J. Sístek, & T. Vejchodský (Eds.), PANM 19: Proceedings of 19th conference, Programs and Algorithms of Numerical Mathematics, Prague: Czech Academy of Sciences, 2019, 149-158.
- [13] S. Sysala: Limit analysis problem and its penalization. COMPLAS 2017 - XV International Conference on Computational Plasticity. Fundamentals and Applications. International Centre for Numerical Methods in Engineering (CIMNE), (Oñate, E.; Owen, R.; Peric, D.; Chiumenti, M. eds.), 2017, 866-875.
- [12] S. Sysala, M. Čermák: Implicit constitutive solution scheme for Mohr-Coulomb plasticity. In: Chleboun, J., Kůs, P., Prikryl, P., Segeth, K., Šístek, J. and Vejchodský, T. (eds.): Programs and Algorithms of Numerical Mathematics. Proceedings of Seminar, Institute of Mathematics CAS, Prague, 2017, 120-129.
- [11] S. Sysala, J. Haslinger: Truncation and Indirect Incremental Methods in Hencky's Perfect Plasticity. In: dell'Isola F., Sofonea M., Steigmann D. (eds.): Mathematical Modelling in Solid Mechanics. Advanced Structured Materials, vol 69, Springer, Singapore, 2017, 265-284.
- [10] M. Čermák, S. Sysala: How to simplify return-mapping algorithms in computational plasticity: Part 1 - Main idea. In: Computational Plasticity III - Fundamentals and Applications - COMPLAS III. Barcelona: International Center for Numerical Methods in Engineering (CIMNE), (Oñate, E. eds), 2015, 1-12.
- [9] M. Čermák, S. Sysala: How to simplify return-mapping algorithms in computational plasticity: Part 2 - Implementation details and experiments. In: Computational Plasticity III - Fundamentals and Applications - COMPLAS III. Barcelona: International Center for Numerical Methods in Engineering (CIMNE), (Oñate, E. eds), 2015, 1-9.
- [8] R. Blaheta, R. Kohut, J. Starý, S. Sysala: Computational and reliability aspects of micro-geomechanics. In: Computer Methods and Recent Advances in Geomechanics: Proceedings of the 14th International Conference of International Association for Computer Methods and Recent Advances in Geomechanics (IACMAG 2014), 2014, 205-210.
- [7] T. Koudelka, J. Kruis, S. Sysala, M. Vokáč: Modeling of damage due to shrinkage in autoclaved aerated concrete. In: Proceedings of the International Conference on Numerical Analysis and Applied Mathematics 2014 (ICNAAM-2014), Vol. 1648. Melville, NY: AIP Publishing, 2016 - (Simos, T.; Tsitouras, C. eds.)
- [6] M. Čermák, S. Sysala: Total-FETI method for solving contact elasto-plastic problems. Lecture Notes in Computational Science and Engineering. Berlin: Springer Verlag, (Erhel, J.; Gander, M.; Halpern, L. eds.), 2014, 955-965.
- [5] S. Sysala: On control of loading process up to the limit load in Hencky plasticity. In: MMOM - Mathematical Modelling and Optimization in Mechanics. Agora: University of Jyväskylä, (Neittaanmäki, P.; Repin, S.; Tuovien, T. eds.), 2014, 84-87.

[4] M. Čermák, J. Haslinger, S. Sysala: Numerical Solution of Perfect Plastic Problems with Contact: Part I - Theory and Numerical Methods. In: Proceedings of the XII International Conference on Computational Plasticity - Fundamentals and Applications. Vol. 12. Barcelona: International Centre for Numerical Methods in Engineering (CIMNE), (Onate, E.; Owen, D.; Peric, D.; Suárez, B.), 2013, 1-12.

[3] M. Čermák, J. Haslinger, S. Sysala: Numerical Solution of Perfect Plastic Problems with Contact: Part II – Numerical Realization. In: Proceedings of the XII International Conference on Computational Plasticity - Fundamentals and Applications. Vol. 12. Barcelona: International Centre for Numerical Methods in Engineering (CIMNE), (Onate, E.; Owen, D.; Peric, D.; Suárez, B.), 2013, 1-11.

[2] S. Sysala: Bending of Beam with Free Ends on Non-linear Subsoil. In: Mechanical Structures and Foundation Engineering 2010. Ostrava: VŠB-TUO, (Frydryšek, K. eds.), 2010, 1-17.

[1] P. Byczanski, S. Sysala: Modified semismooth Newton method: numerical example. In: Proc. of the Seminar SIMONA, TU Liberec, 2009, 24-30.

Softwares:

[2] M. Čermák, S. Sysala, J. Valdman: Matlab FEM package for elastoplasticity, 2018.
https://github.com/matlabfem/matlab_fem_elastoplasticity

[1] M. Čermák, Martin – S. Sysala. SS-JG-P, SS-DP-NH, SS-DP-AP. 2017.
<http://www.ugn.cas.cz/index.php?l=en&a=&v=&p=publish/output.php>

Editorials:

[3] R. Blaheta, J. Haslinger, S. Sysala, P. Arbenz, J. Kraus: MATCOM special issue Modelling 2019: International Conference on Mathematical Modelling and Computational Methods in Applied Sciences and Engineering. Mathematics and Computers in Simulation. Available online 5 April 2021.

[2] S. Sysala, P. Tichy: Editorial – Special issue on the occasion of the Seminar on Numerical Analysis, 21. -25. 1. 2019, Ostrava, Czech Republic. APPLICATIONS OF MATHEMATICS, **65** (2020) 121-122.

[1] M. Rozložník, S. Sysala: Editorial – Special issue on the occasion of the Seminar on Numerical Analysis, 30.1.-3.2.2017, Ostrava, Czech Republic. APPLICATIONS OF MATHEMATICS, **62** (2017) 535-536.

Other:

[2] S. Sysala: Laudation for the 70th birthday of Professor Radim Blaheta. Mathematics and Computers in Simulation. Available online 7 May 2021.

[1] S. Sysala: Linear elasticity problem: analysis and solution. Textbook for VSB-Technical University in Ostrava, 2020, 37 pages.