

LIST OF PUBLICATIONS

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Papers in Journals, Book Series and Conference Proceedings

1. N. B. Ivanov, S. I. Petrova, and J. Schnack, *Heisenberg spin chain with three-body exchange interactions*, Highly Frustrated Magnetism (HFM 2018), July 9-14, 2018, University of California, Davis, Published in HFM Booklet, p.82.
2. S. I. Petrova, *Solution techniques for structural optimization problems*, ICMA-MU 2016 Book on the Conf. Proc., December 17-19, 2016, Bangkok, Thailand, ISBN: 978-616-279-956-3, Published by Centre of Excellence in Mathematics, Mahidol University, pp.105-114.
3. N. B. Ivanov, S. I. Petrova, and J. Schnack, *Alternating-spin $S=3/2$ and $\sigma=1/2$ Heisenberg chain with isotropic three-body exchange interactions*, Eur. Phys. J. B (2016), pp.89-121.
4. N. B. Ivanov, S. I. Petrova, and J. Schnack, *Alternating-spin $(3/2,1/2)$ Heisenberg chain with isotropic three-site interactions*, Highly Frustrated Magnetism (HFM 2016), September 7-11, 2016, Taipei, Taiwan, Published in HFM E-book, p.89.
5. S. I. Petrova, *Applications of Shape and Topoly Optimization*, AMMO (Eds. H.-J. Kruse und T. Lask), University of Applied Sciences Bielefeld, ISSN: 2196-6192, 4(2016), pp.130-152.
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7. S. I. Petrova, *Efficient solution techniques for multiscale structural optimization in materials science*, MRS Online Proceedings Library, **1535**(2013), mmm12-a-0034, Cambridge University Press.
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9. S. I. Petrova, *Topology optimization of eddy current systems by level-set and primal-dual methods*, Proc. IMECS, Hong-Kong, 17-19 March, 2010, Vol.I, pp. 327-332, IAENG Publisher, ISBN: 978-988-17012-8-2, 2010.
10. R. H.W. Hoppe and S. I. Petrova, *Multi-scale method for the crack problem in microstructural materials*, Comput. Methods Appl. Math., **10**(2010), No.1, pp. 69-86.
11. S. I. Petrova, *On shape optimization of acoustically driven microfluidic biochips*, Lecture Notes in Computer Science, Springer, (I. Lirkov et al., eds.), **5910**(2010), pp. 821-828.
12. S. I. Petrova, *Applications of one-shot methods in PDEs constrained optimization*, Math. Comput. Simul., **80**(2009), No.3, pp. 581-597.
13. R. H.W. Hoppe and S. I. Petrova, *Path-following methods for shape optimal design of periodic microstructural materials*, Optimization Methods and Software, **24**(2009), No.2, pp. 205-218.
14. R. H.W. Hoppe and S. I. Petrova, *Elasto-plasticity model in structural optimization of composite materials with periodic microstructures*, Math. Comput. Simul., **74**(2007), No.6, pp. 468-480.
15. R. H.W. Hoppe and S. I. Petrova, *Adaptive refinement techniques in homogenization design method*, Free and Moving Boundaries: Analysis, Simulation and Control, Lecture Notes in Pure and Applied Mathematics, Vol.252, (R. Glowinski et al., eds.), New York; Marcel Dekker, 2007, Chapter 19, pp.349-362.
16. S. Bordas, R. H.W. Hoppe, and S. I. Petrova, *Mechanical failure in microstructural heterogeneous materials*, Lecture Notes in Computer Science, Springer (T. Boyanov et al., eds.) **4310**(2007), pp. 533-541.
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19. R. H.W. Hoppe and S. I. Petrova, *Efficient solvers for 3-D homogenized elasticity model*, Lecture Notes in Computer Science, Springer (J. Dongarra et al., eds.), **3732**(2006), pp. 857-863.
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21. R. H.W. Hoppe and S. I. Petrova, *On the return mapping algorithms in structural optimization of biomorphic ceramics*, Proc. 6th World Congress on Structural and Multidisciplinary Optimization, Rio de Janeiro, Brazil, May 29 - June 3, 2005 (J. Herskovits et al., eds.), CD-ROM, ISBN:85-285-0070-5.
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Technical Reports

1. R. H.W. Hoppe and S. I. Petrova, *Shape optimal design of periodic microstructural materials*, Preprint No.16, April 2008, University of Augsburg, Germany.
2. R. H.W. Hoppe and S. I. Petrova, *Combined mesh superposition method and homogenization approach for a crack problem in periodic composites*, Preprint No.20, July 2007, University of Augsburg, Germany.
3. R. H.W. Hoppe and S. I. Petrova, *On the return mapping algorithms in structural optimization of biomorphic ceramics*, Preprint No.19, July 2007, University of Augsburg, Germany.
4. R. H.W. Hoppe and S. I. Petrova, *Shape optimization in biomimetics by homogenization modelling*, ICTP Preprint IC/2003/83, August 2003, Trieste-Miramare.
5. S. I. Petrova, L. Tobiska, and P. S. Vassilevski, *Algebraic multigrid methods for non-conforming streamline-diffusion finite element discretization of convection-diffusion problems*, Preprint No.30, November 1997, Dept.of Mathematics, Otto-von-Guericke-University Magdeburg, Germany.

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9. Cl. Brand and S. I. Petrova, *Preconditioned iterations to calculate extreme eigenvalues*, Tech. Rep. #1994-1, Mining University Leoben, Austria; presented at the Colorado Conference on Iterative Methods, April 4-10, 1994, Breckenridge, Colorado, USA.

PhD Thesis

1. S. I. Petrova, *Iterative methods for solving differential equations on grids with local refinement*, PhD Thesis, 1993, University of Sofia (144 pages, in Bulgarian).