

LIST OF PUBLICATIONS

K. D. CHEREDNICHENKO

Journal papers: refereed

29 publications in peer-reviewed mathematics and mechanics journals (additionally, 7 in review at present). The published articles are split roughly by subject area, more recent first within each group.

HOMOGENISATION: LINEAR ELLIPTIC PDE

1. (with J. Evans) Full two-scale asymptotic expansion and higher-order constitutive laws in the homogenisation of the system of Maxwell equations, *Multiscale Modeling and Simulation (SIAM)* **14**(4), 1513–1539 (2016).
2. (with A. Kiselev) Norm-resolvent convergence of one-dimensional high-contrast periodic problems to a Kronig-Penney dipole-type model, *Communications in Mathematical Physics* **349**, 441–480 (2017).
3. (with S. Cooper) Resolvent estimates for high-contrast homogenisation problems. *Archive for Rational Mechanics and Analysis*, **219**(3), 1061–1086 (2016).
4. (with S. Cooper) Homogenisation of the system of high-contrast Maxwell equations. *Mathematika* **61**(2), 475–500 (2015).
5. Some analogues of the double-porosity models and the associated effect of micro-resonance. *Journal of Mathematical Sciences* **176**(6), 818–827 (2011).
6. Two-scale asymptotics for non-local effects in composites with highly anisotropic fibres. *Asymptotic Analysis* **49**(1–2), 39–59 (2006).
7. (with V. P. Smyshlyaev and V. V. Zhikov) Non-local homogenised limits for composite media with highly anisotropic periodic fibres. *Proceedings of the Royal Society of Edinburgh: Section A* **136**(1), 87–114 (2006).
8. (with V. P. Smyshlyaev) On rigorous derivation of strain gradient effects in the overall behaviour of periodic heterogeneous media. *Journal of the Mechanics and Physics of Solids* **48**(6–7), 1325–1357 (2000).

HOMOGENISATION: NONLINEAR PDE AND CALCULUS OF VARIATIONS

9. (with M. Cherdantsev and S. Neukamm) Homogenisation in finite elasticity for composites with a high contrast in the vicinity of rigid-body motions. *Asymptotic Analysis* **104**(1–2), 67–102 (2017).
10. (with M. Cherdantsev) Bending of thin periodic plates. *Calculus of Variations and Partial*

Differential Equations **54**(4), 4079–4117 (2015).

11. (with M. Cherdantsev) Two-scale Γ -convergence and its application to homogenisation of high-contrast variational integrals. *Archive for Rational Mechanics and Analysis* **204**(2) 445–478 (2012).

12. (with V. P. Smyshlyaev) On full two-scale expansion of the solutions of nonlinear periodic rapidly oscillating problems and higher-order homogenised variational problems. *Archive for Rational Mechanics and Analysis* **174**(3), 385–442 (2004).

OPERATOR THEORY, SCATTERING AND APPLICATIONS

13. (with A. V. Kiselev and L. O. Silva) Functional model for extensions of symmetric operators and applications to scattering theory. *To appear in Networks and Heterogeneous Media* (arXiv:1703.06220).

14. (with M. Waurick) Resolvent estimates in homogenisation of periodic problems of fractional elasticity, 22pp. *To appear in Journal of Differential Equations* (arXiv: 1706.02988).

ASYMPTOTIC ANALYSIS FOR WAVE PROPAGATION

15. (with S. Cooper) Asymptotic behaviour of the spectra of systems of Maxwell equations in periodic composite media with high contrast, 21pp. *To appear in Mathematika* (arXiv: 1601.01305).

16. (with S. Cooper and S. Guenneau) Spectral analysis of one-dimensional high-contrast elliptic problems with periodic coefficients. *Multiscale Modeling and Simulation* **13**(1), 72–98 (2015).

17. (with S. D. M. Adams, R. V. Craster and S. Guenneau) High-frequency spectral analysis of thin periodic acoustic strips: theory and numerics. *European Journal of Applied Mathematics* **21**(6), 557–590 (2010).

18. (with S. Guenneau) Bloch-wave homogenisation for spectral asymptotic analysis of the periodic Maxwell operator. *Waves in Random and Complex Media* **17**(4), 627–651 (2007).

19. Asymptotic expansion of the boundary-layer type for flexural waves along the curved edge of a Kirchhoff-Love plate. *Zapiski Nauchnykh Seminarov POMI (Scientific Notes of the Steklov Institute of Mathematics, St. Petersburg)* **332**, 286–298 (2006) (in Russian). English version in: *J. Math.Sci. (N. Y.)* **142**(6), 2682–2688 (2007).

20. On propagation of attenuated Rayleigh waves along a fluid-solid interface of arbitrary shape. *The Quarterly Journal of Mechanics and Applied Mathematics* **59**(1), 75–94 (2006).

21. On propagation of Scholte-Gogoladze waves along a fluid-solid interface of arbitrary shape. *Zapiski Nauchnykh Seminarov POMI (Scientific Notes of the Steklov Institute of Mathematics, St. Petersburg)* **324**, 229–247 (2005) (in Russian). English version in: *Journal of Mathematical Sciences (New York)* **138**(2), 5613–5622 (2006).

22. (with P. Padilla) On derivation of the density of states for periodic operators by the method of asymptotic expansion. *Proceedings of the Edinburgh Mathematical Society* **48**(1), 51–60 (2005).

23. (with V. M. Babich) On a differential equation with a singular point of regular type and a large parameter. *Integral Transforms and Special Functions* **11**(2), 101–112 (2001).

24. (with V. M. Babich) On Fock’s type asymptotics of Legendre functions. *Integral Transforms and Special Functions* **5** (1–2), 1–18 (1997).

APPLIED MATHEMATICS

25. (with S. Cooper) On the existence of high-frequency boundary resonances in layered elastic media. *Proceedings of the Royal Society A* **471**, 20140878; DOI: 10.1098/rspa.2014.0878 (2015), 16 pp. (2015).

26. An approach to constitutive modelling of elasto-plasticity via averaging of the dislocation transport. *Journal of the Mechanics and Physics of Solids* **58**(5), 798–809 (2010).

27. (with N. F. Britton, C. Carrillo and M. Mogie) Dynamic coexistence of sexual and asexual invasion fronts in a system of integro-difference equations. *Bulletin of Mathematical Biology* **71**(7), 1612–1625 (2009).

28. (with F. J. Sabina) On the existence of waves guided by a cavity in an elastic film. *Quarterly Journal of Mechanics and Applied Mathematics* **62**(3), 221–233 (2009).

29. (with G. W. Milton, N.-A. Nicorovici, R. C. McPhedran and Z. Jacob) Solutions in folded geometries and associated cloaking due to anomalous resonance. *New Journal of Physics* **10**(11), 115021 (2008).

Book chapter

“Homogenisation techniques for periodic structures”(with T. Antonakakis, S. Cooper, S. Guenneau and R. Craster) in: *Gratings: Theory and Numeric Application* (ISBN: 978-2-85399860-4), Fresnel Institute, 2012.

Papers: in review

1. (with J. Evans) Homogenisation of thin periodic frameworks with high-contrast inclusions, 19pp., *arXiv:1601.00663*.

2. (with M. Cherdantsev and S. Cooper) Extreme localisation of eigenfunctions to one-dimensional high-contrast periodic problems with a defect, 25pp., *arXiv:1702.03538*.

3. (with P. Dondl and F. Rösler) Norm-resolvent convergence in perforated domains, 19pp., *arXiv:1706.05859*.

4. (with M. Cherdantsev and I. Velčić) Stochastic homogenisation of high-contrast media, 24pp., *arXiv:1712.00333*.

5. (with I. Velčić) Sharp operator-norm asymptotics for linearised elastic plates with rapidly oscillating periodic properties, 25pp.

6. (with A. Kiselev and L. Silva) Scattering theory for non-selfadjoint extensions of symmetric operators, 29pp., *arXiv:1712.09293*.

7. (with A. Kiselev and Y. Ershova) Dispersive effective behaviour of high-contrast periodic media, 13pp.

Preprint

Two-scale series expansions for travelling wave packets in one-dimensional periodic media, 11pp. *Preprint NI15048*, Isaac Newton Institute (2015).

Patent

PCT International Application No. PCT/GB2016/051124 “Subterranean Design Process” (April 2016)

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