

# LIST OF PUBLICATIONS

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## Journal Papers: Refereed

36. (with Y. Ershova and A. Kiselev) Time-dispersive behaviour as a feature of critical contrast media. *To appear in SIAM Journal on Applied Mathematics* (2019)
35. (with J. Evans) Homogenisation of thin periodic frameworks with high-contrast inclusions. *Journal of Mathematical Analysis and Applications*, **473**(2), 658–679 (2019)
34. (with M. Cherdantsev and S. Cooper) Extreme localisation of eigenfunctions to one-dimensional high-contrast periodic problems with a defect, *To appear in SIAM Journal on Mathematical Analysis*, 29 pp. (arXiv:1702.03538).
33. (with A. V. Kiselev and L. O. Silva) Scattering theory for a class of non-selfadjoint extensions of symmetric operators. *To appear in Operator Theory: Advances and Applications*, 31pp. (arXiv:1712.09293)
32. (with M. Cherdantsev and I. Velčić) Stochastic homogenisation of high-contrast media. *Applicable Analysis* **98**(1-2), 91–117 (2019)
31. (with P. Dondl and F. Rösler) Norm-resolvent convergence in perforated domains. *Asymptotic Analysis* **110**(3–4) 163–184.
30. (with S. D’Onofrio) Operator-norm convergence estimates for elliptic homogenisation problems on periodic singular structures. *Journal of Mathematical Sciences* **232**(4), 558–572 (2018).
29. (with A. V. Kiselev and L. O. Silva) Functional model for extensions of symmetric operators and applications to scattering theory. *Networks and Heterogeneous Media* **13**(2), 191–215 (2018)
28. (with M. Waurick) Resolvent estimates in homogenisation of periodic problems of fractional elasticity. *Journal of Differential Equations* **264**(6), 3811–3835 (2018).
27. (with S. Cooper) Asymptotic behaviour of the spectra of systems of Maxwell equations in periodic composite media with high contrast. *Mathematika* **64**(2), 583–605 (2018).
26. (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).
25. (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).

24. (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).
23. (with S. Cooper) Resolvent estimates for high-contrast homogenisation problems. *Archive for Rational Mechanics and Analysis* **219**(3), 1061–1086 (2016).
22. (with M. Cherdantsev) Bending of thin periodic plates. *Calculus of Variations and Partial Differential Equations* **54**(4), 4079–4117 (2015).
21. (with S. Cooper) Homogenisation of the system of high-contrast Maxwell equations. *Mathematika* **61**(2), 475–500 (2015).
20. (with S. Cooper) On the existence of high-frequency boundary resonances in layered elastic media. *Proceedings of the Royal Society A* **471**, 20140878 (2015).
19. (with S. Cooper and S. Guenneau) Spectral analysis of one-dimensional high-contrast elliptic problems with periodic coefficients. *Multiscale Modeling and Simulation (SIAM)* **13**(1), 72–98 (2015).
18. (with M. Cherdantsev) Two-scale  $\Gamma$ -convergence and its application to homogenisation of high-contrast variational integrals. *Archive for Rational Mechanics and Analysis* **204**(2) 445–478 (2012).
17. Some analogues of the double-porosity models and the associated effect of micro-resonance. *Journal of Mathematical Sciences* **176**(6), 818–827 (2011).
16. 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).
15. (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).
14. (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).
13. (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).
12. (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).

11. 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).
10. (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).
9. Two-scale asymptotics for non-local effects in composites with highly anisotropic fibres. *Asymptotic Analysis* **49**(1–2), 39–59 (2006).
8. 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).
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).
6. 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).
5. (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).
4. (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).
3. (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).
2. (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).
1. (with V. M. Babich) On Fock’s type asymptotics of Legendre functions. *Integral Transforms and Special Functions* **5** (1–2), 1–18 (1997).

## 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

R1. (with I. Velčić) Sharp operator-norm asymptotics for linearised elastic plates with rapidly oscillating periodic properties, 25 pp., *arXiv: 1802.02639*.

R2. (with W. Graham) Leontovich boundary condition and associated surface waves, 16 pp., *arXiv:1802.06921*.

R3. (with Y. Ershova, A. Kiselev and S. Naboko) Unified approach to critical-contrast homogenisation with explicit links to time-dispersive media, 37 pp., *arXiv:1805.00884*.

R4. (with Y. Ershova and A. Kiselev) Unified approach to critical-contrast homogenisation of PDEs with explicit links to time-dispersive media. I., 33 pp., *arXiv:1808.03961*.

## Preprint

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

## Patent

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

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