List of publications containing calculations of bulk material parameters (coauthored by C.R. Simovski)

Monograph

C.R. Simovski, Weak spatial dispersion in composite media, 139 pages, ISBN 5-7325-0770-1, Polytekhnika, St. Petersburg, 2003 (in Russian).

Papers in refereed journals

1. S.A. Tretyakov, F. Mariotte, C.R. Simovski, T.G. Kharina, J.-P. Heliot, Analytical antenna model for chiral scatterers: Comparison with numerical and experimental data, *IEEE Transactions on Antennas and Propagation,* vol. 44, no. 7, pp. 1006-1014, 1996.

2. S.A. Tretyakov, A.A. Sochava, C.R. Simovski, Influence of chiral shapes of individual inclusions on the absorption in chiral composite coatings, *Electromagnetics,* vol. 16, no. 2, pp. 113-127, 1996.

3. A.N. Lagarkov, V.N. Semenenko, V.A. Chistyaev, D.E. Ryabov, S.A. Tretyakov, C.R. Simovski, Resonance properties of bi-helix media at microwaves, *Electromagnetics,* vol. 17, no. 3, pp. 213-237, 1997.

4. C.R. Simovski, First-order spatial dispersion and Maxwell-Garnett modeling of composites, *International Journal of Electronics and Communications (AEÜ)*, V.52, No 1, pp. 76-81, 1998

5. T.G. Kharina, S.A. Tretyakov, A.A. Sochava, C.R. Simovski, S. Bolioli, Experimental studies of artificial omega media, *Electromagnetics,* vol. 18, no. 4, pp. 423-437, 1998.

6. S.A. Tretyakov, A.H. Sihvola, A.A. Sochava, C.R. Simovski, Magnetoelectric interactions in bi-anisotropic media, *J. of Electromagnetic Waves and Applications,* vol. 12, no. 4, pp. 481- 497, 1998.

7. C.R. Simovski, S. He, A rapidly convergent numerical method for calculating the conductivity of lattices, *Journal of Applied Physics,* V. 83, No 7, 3773-3780, 1999.

8. P.A. Belov, Simovski C.R., The Clausius-Mossotti and Lorentz-Lorenz formulae for the anisotropic artificial dielectrics, *Vestnic molodih uchenih: fizicheskie nauki (magazine of young scientists: physical sciences),* vol. 1, pp.34-40, 2000 (in Russian).

9. C.R. Simovski, S.A. Tretyakov, A.H. Sihvola, M.M. Popov, On the surface effect in thin molecular or composite layers, *European Physical J. Applied Physics,* vol. 9, no. 3, pp. 195-204, 2000.

10. C.R. Simovski, S. He, M.Popov, "On the dielectric properties of thin molecular or composite layers", *Phys. Rev. B*, vol. 62, no. 20, pp. 13718-13730, 2000.

11. C.R. Simovski, On the averaging of induced multipoles in media with weak spatial dispersion, *International Journal of Electronics and Communications (AEU)*, vol. 54, no. 3, pp. 271-274, 2000.

12. C.R. Simovski, B. Sauviac. On the bulk averaging approach for obtaining the effective parameters of thin magnetic granular films, *European Physical Journal: Applied Physics*, vol. 17, no. 1, pp. 11-20, 2002.

List of publications containing calculations of bulk material parameters (coauthored by C.R. Simovski)

13. C.R. Simovski, E. Verney, S. Zouhdi, and A. Fourrier-Lamer, "Homogenization of planar bianisiotropic arrays on the dielectric interface", *Electromagnetics*, vol. 22, pp. 177-189, 2002.

14. P.A. Belov, C.R. Simovski, S.A. Tretyakov, Two-dimensional electromagnetic crystals formed by reactively loaded wires, *Physical Review E*, vol. 66, 036610(1-6), 2002.

15. P.A. Belov, R. Marques, M.G. Silveirinha, I.S. Nefedov, C.R. Simovski, S.A. Tretyakov, Strong spatial dispersion in wire media in the very long wavelength limit, *Physical Review B*, vol. 76, 113103 (1-5) 2003.

16. C.R. Simovski, Sauviac B., Prosvirnin S.L., Homogenization of an array of S-shaped particles, located on a dielectric interface, P*rogress in Electromagnetic Research*, vol. PIER39, 239-264, 2003

17. C.R. Simovski, Belov P.A., He S., Backward wave region and negative material parameters of a structure formed by lattices of wires and split-ring resonators, *IEEE Transactions on Antennas and Propagation,* V. 54*,* No 12, 2582-2590, 2003.

18. C.R. Simovski, S. He, Frequency range and explicit expressions for negative permittivity and permeability of an isotropic medium formed by a lattice of perfectly conducting Omega-particles, *Physics Letters, A*, vol. 311, 254-263, 2003.

19. P.A. Belov, Simovski C.R., Tretyakov S.A., An example of bi-anisotropic electro-magnetic crystals: the spiral medium, *Physical Review E*, vol. 67, 056622(1-8), 2003.

20. C.R. Simovski, B. Sauviac, Toward creating isotropic microwave composites with negative refraction, *Radio Science*, Vol. 39, No 4, pp. 2014-2032, 2004.

21. C.R. Simovski, P.A. Belov, Low-frequency spatial dispersion in wire media, *Phys. Rev. E*, vol. 70, 046616(1-8), 2004.

22. C.R. Simovski, B. Sauviac, Role of wave interaction of wires and split-ring resonators for the losses in a left-handed composite, *Physical Review, E*, 70, pp. 046607 (1-11), 2004.

23. D. Vincent, T. Rouiller, C. Simovsky, B. Bayard, G. Noyel, A new broadband method for magnetic thin-film characterization in the microwave range, *IEEE Transactions on Microwave Theory and Technique*, vol. 53, No 4, pp. 1174-1180, 2005.

24. P. A. Belov, C. R. Simovski, On homogenization of electromagnetic crystals formed by uniaxial scatterers, *Phys. Rev. E*, Vol. 72, 026615(1-10), 2005.

25. P. A. Belov and C. R. Simovski, Boundary conditions for interfaces of electromagnetic (photonic) crystals and generalized Ewald-Oseen extinction principle, *Phys. Rev. B*, Vol. 73, 045102 (1-12), 2006.

26. C.R. Simovski, S.A. Tretyakov, Local constitutive parameters of metamaterials from an effective-medium perspective, *Phys. Rev. B*, Vol. 75, 195111(1-9), 2007.

27. S.A. Tretyakov, C.R. Simovski, M. Hudlička, Bianisotropic route to the realization and matching of backward-wave metamaterial slabs, *Phys. Rev. B*, Vol. 75, 153104(1-4), 2007.

List of publications containing calculations of bulk material parameters (coauthored by C.R. Simovski)

28. C.R. Simovski, Application of the Fresnel formulas for reflection and transmission of electromagnetic waves beyond the quasi-static approximation, *Radiotechnika i elektronia (Journal of Communication Technology and Electronics)*, Vol. 52, No. 9, 953-971, 2007 (data of the English version).

29. C.R. Simovski. Bloch material parameters of magneto-dielectric metamaterials and the concept of Bloch lattices, *Metamaterials*, *V. 1, Issue 2*, pp. 62-80, 2007.

30. P. Ikonen, E. Saenz, R. Gonzalo, C. Simovski and S. Tretyakov, Mesoscopic effective material parameters for thin layers modeled as single and double grids of interacting loaded wires, *Metamaterials*, V. 1, Issue 2, pp. 89-105, 2007

Book chapters

1. Belov P.A., Simovski C.R., Oblique propagation of electromagnetic waves in regular 3D lattices of scatterers (dipole approximation), *SPIE Proc.,* vol. 4073, pp. 266-276, 2000.

2. Belov P.A., Simovski C.R., Analytical study of dispersion curves of three-dimentional photonic crystals, in: S. A. Kozlov Editor, *Optical and laser technologies,* St. Petersburg, SPIFMO, pp. 58-66, 2001 (in Russian).

3. S.A. Tretyakov, I.S. Nefedov, C.R. Simovski, S.I. Maslovski, Modelling and microwave properties of artificial materials with negative parameters, in *Advances in Electromagnetics of Complex Media and Metamaterials,* S. Zouhdi, A. Sihvola, and M. Arsalane (editors), NATO Series II: Mathematics, Physics, and Chemistry, Vol. 89, Kluwer Academic Publishers, 2002, pp. 99-122.

4. C.R. Simovski, Dispersion properties of metal photonic crystals form parallel spirals, in *Advances in Electromagnetics of Complex Media and Metamaterials,* S. Zouhdi, A. Sihvola, and M. Arsalane (editors), NATO Series II: Mathematics, Physics, and Chemistry, Vol. 89, Kluwer Academic Publishers, 2002, pp. 207-227.

Conference papers

1. S.A. Tretyakov, Mariotte F., C. R. Simovski, Kharina T.G., Approximate analytical models for material parameters of chiral and omega composites, Proc. 3-d Int. Conf. on bianisotropic media *Chiral' 94*, Perigueux, France, 287-292, May 1994.

2. S.A. Tretyakov, C. R. Simovski, F. Mariotte, S. Bolioli, T.G. Kharina, Scattering by omega shaped conductive particles and omega composite modelling, *URSI International Symposium on Electromagnetic Theory,* St. Petersburg, Russia, pp. 679-681, May 1995.

3. S.I. Maslovski, C.R. Simovski, S.A. Tretyakov, Constitutive equations for media with secondorder spatial dispersion, *Bianisotropics'98,* 7th International Conference on Complex Media, Braunschweig, Germany, pp. 197-200, May 1998.

List of publications containing calculations of bulk material parameters (coauthored by C.R. Simovski)

4. S.I. Maslovski, S.A. Tretyakov, C.R. Simovski, Electromagnetic modelling of composite media with second-order spatial dispersion, Proc. *XXVI General Assembly of the International Union of Radio Science,* University of Toronto, Canada, p. 91-92, 1999.

5. Belov P.A., Simovski C.R., Kondratjev M.S., On the relations of microscopic and averaged material parameters in composite media, *2000 IEEE Ant. Propag*. Int. Symp., Salt Lake City, Utah USA, Vol. 1, pp. 364-367, June 2000.

6. Sauviac B., Simovski C.R., Anisotropie de surface dans les films magnétiques minces, Travaux de10-ième Conf. Internationale *Ondes Hyperfrequentes et Dispersion* (OHD'10), pp. 78-81, Paris, France, Septembre 2000,

7. S.A. Tretyakov, C.R. Simovski, Negative epsilon, negative mu, etc.: what radio engineers know about that, Proc. of *Electromagnetic Crystal Structures,* ed. by T.F. Krauss, University of St. Andrews, UK, June 2001.

8. P.A. Belov, C.R. Simovski, S.A. Tretyakov, Band gap structure of simple cubic lattices of small resonant inclusions, in *Advances in Optics and Electromagnetics of Photonic Band Gap Structures,* Proceedings of the seminar *Optics of Photonic Crystals,* International conference for young scientists *Optics'2001,* St. Petersburg State Institute of Fine Mechanics and Optics (Technical University), pp. 15-17, 2001.

9. C.R. Simovski, B. Sauviac, Surface anisotropy of thin ferrite films, in *Advances in Optics and Electromagnetics of Photonic Band GapStructures,* Proceedings of the seminar *Optics of Photonic Crystals,* International conference for young scientists *Optics'2001,* St. Petersburg State Institute of Fine Mechanics and Optics (Technical University), pp. 55-57, 2001.

10. S.A. Tretyakov, I.S. Nefedov, S.I. Maslovski, C.R. Simovski, B. Sauviac, Modelling and microwave properties of artificial materials with negative parameters, Proc. *NATO Advanced Research Workshop Bianisotropics'2002 (9th International Conference on Electromagnetics of Complex Media),* Marrakech, Morocco, p. 36-37, May 8-11, 2002.

11. P.A. Belov, C.R. Simovski, S.A. Tretyakov, Two-dimensional electromagnetic crystals formed by complex-shaped and loaded wires, proc. *NATO Advanced Research Workshop Bianisotropics'2002 (9th International Conference on Electromagnetics of Complex Media),* Marrakech, Morocco, p. 51-52, May 8-11, 2002.

12. C.R. Simovski, B. Sauviac, Sur l'anisotropie des couches minces magnetiques, Conf. Nationale *Journees Maxwells'2002*, pp. 68-70, Toulouse, France, Mars 2002.

13. P.A. Belov, S.A. Tretyakov, C.R. Simovski, Artificial bi-anisotropic electromagnetic crystals, *2002 IEEE Antennas and Propagation Society International Symposium and USNC/URSI National Radio Science Meeting,* San Antonio, TX, USA, URSI Digest, p. 115, June 16-21, 2002.

14. P.A. Belov, S.A. Tretyakov, C.R. Simovski, Analytical investigations of dispersion and reflection in two-dimensional electromagnetic crystals formed by thin infinite loaded wires, URSI XXVIIth General Assembly, Maastricht, the Netherlands, 17-24 August, 2002, CDROM Proceedings, paper 60.

List of publications containing calculations of bulk material parameters (coauthored by C.R. Simovski)

15. Simovski C.R., Belov P.A., Backward wave region and negative material parameters of a structure formed by lattices of wires and SRRs, *IEEE APS Digest*, Vol. 4, pp. 659-663, 2003.

16. P.A. Belov, C.R. Simovski, R. Marques, S.I. Maslovski, I.S. Nefedov, M. Silveirinha, Strong spatial dispersion in wire media in the very large wavelength limit, Proc. of *URSI 2004 International Symposium on Electromagnetic Theory,* Pisa, Italy, vol. 1, pp. 621-623, May 23- 27, 2004.

17. C. Simovski, S. Tretyakov, S. Maslovski, Meta-materials supporting backward waves in the microwave range, *Progress in Electromagnetics Research Symposium PIERS 2004*, Nanjing, China, p. 171, August 28-31, 2004.

18. D. Vincent, C. Simovsky, T. Rouille, G. Noyel, Charcterisation des couches minces magnetiques dans les lignes coplanaires, Cong. Nationale *Journées de Caractérisation Micro-ondes des Matériaux (JCMM'2004)*, La Rochelle, France, paper B8, March 2004

19. C. Simovski, B. Sauviac, Wide band uniaxial doubly negative metamaterial with low losses, Proc. 10-th Int. Conference on complex materials *Bianisotropics'2004*, Gent, Belgium, Sept. 2004, pp. 68-71

20. P.A. Belov, C.R. Simovski, I.S. Nefedov, S.A. Tretyakov, Low-frequency superprism effect and hybridization of transmission-line models in two- and three-dimensional wire media, Proceedings *Progress in Electromagnetics Research Symposium,* Hangzhou, China, pp. 285-289, August 22-26, 2005.

21. C.R. Simovski, P. Ikonen, S. Tretyakov, On the microstrip characterization of artificial magneto-dielectric structures, Abstracts of the *Progress in Electromagnetics Research Symposium 2006,* Cambridge, USA, p. 261, March 26-29, 2006.

22. C.R. Simovski, S. Tretyakov, On the homogenization of artificial lattices, Proc. *Days on Diffraction'2006,* St. Petersburg, Russia, p. 70-72, May 30 – June 2, 2006.

23. C.R. Simovski, I. Kolmakov, S.A. Tretyakov, Approaches to the homogenization of periodical metamaterials, *MMET'06, 11th Int. Conf. on Mathematical Methods in Electromagnetic Theory,* Kharkov, the Ukraine, pp. 41-44, June 26 – 29, 2006.

24. S.A. Tretyakov, C.R. Simovski, M. Hudlicka, Bianisotropic media as backward-wave metamaterials, Proceedings of *Bianisotropics'2006 - International Conference on Complex media and Metamaterials,* Samarkand, Uzbekistan (printed as Helsinki University of Technology Electromagnetics Laboratory Report Series, Report 478), pp. 60-62, September 25-27, 2006.

25. C.R. Simovski and S.A. Tretyakov, On effective material parameters of metamaterials, Proc. *23rd Annual Review of Progress in Applied Computational Electromagnetics*, pp. 150-154, Verona, Italy, 19-23 March 2007.

26. P. Ikonen, E. Saenz, R. Gonzalo, C. Simovski, S. Tretyakov, Mesoscopic "effective material parameters" for single and double grids of loaded wires describing induced dipole moment densities and averaged fields, Proceedings of 1st int. Cong. *Metamaterials'2007*, pp. 613-616, Rome, Italy, 22-24 October 2007.

List of publications containing calculations of bulk material parameters
(coauthored by C.R. Simovski)

27. C.R. Simovski and S.A. Tretyakov. Towards isotropic optical magnetism without strong spatial dispersion, Proc. *Metamaterials'2008,* 2d Int. Congress. Pamplona, pp. 68-71, Spain, Sept. 22-26, 2008.

28. E.A. Yankovskaya, P.A. Belov, and C.R. Simovski, Extraction of material parameters from reflection and transmission coefficients of multilayered nano-fishnet metamaterials, Proc. M*etamaterials'2008*, 2d Int. Congress, pp. 141-1423, Pamplona, Spain, Sept. 22-26, 2008.

29. S.A. Tretyakov and C.R. Simovski, Metamaterials effective material parameters: Are two tensors enough? 2d Int. Congress, Proc. M*etamaterials'2008*, 2d Int. Congress, pp. 44-46, Pamplona, Spain, Sept. 22-26, 2008.