

CURRICULUM VITAE

Biographical data:

Name	Sergey V. Kuznetzov
Date of birth	29 th Oct 1951
Place of birth	Moscow, Russia
Marital status	Married
Language	Russian, English fluently
Education	Moscow Institute of Civil Engineering (MICE), 1969-1974
PhD degree	MICE, 1978 (Theoretical Modelling and Numerical Algorithms in Mechanics of Filamentary Composites)
DSc degree	Institute for Problems in Mechanics of Russian Academy of Sciences, 1992 (Fundamental and Singular Solutions in Mechanics of Anisotropic Bodies)

Actual position and official address:

Professor and leading scientist at the Institute for Problems in Mechanics
of Russian Academy of Sciences

Official address: Institute for Problems in Mechanics
Prosp. Vernadskogo, 101,
Moscow, 119526, Russia

Tel.: (+7)-495-6034549

Fax.: (+7)-495-6034548

e-mail address: kuzn-sergey@yandex.ru

web-page: <http://www.ipmnet.ru/~svkuznec/>

Professional activity:

1974-79	Research assistant at the Laboratory of Photoelasticity (Moscow)
1984-85	Research at University of Bath (UK)
1979-92	Assistant, Lecturer, Reader at MICE (Moscow)
1989-90	Research at Harbin Shipbuilding Institute (Harbin, China)
1992-up to now	Professor of Strength of Materials at MICE (Moscow);
1997-up to now	Professor at the Institute for Problems in Mechanics (IPM)
1998	Visiting Professor at Rock Mechanics Institute (Normann, USA)
2000-2001	Professor at Moscow State University of Aviation Technology MATI (Moscow)
2000-2006	Director of the Anisotropic Elastic Media Research Group (AEMRG, Moscow)
2002	Visiting Professor at BAM (Berlin, Germany)
2006	EMMME visiting Professor (Erasmus Mundus INSA de Lyon, France)
2006, 2008, 2011	Visiting professor at LGCIE (INSA de Lyon, France)
2014	Visiting professor at Griffith University (Gold Coast, Australia)

Affiliation: GAMM (1999-)

Council for Scientific Awards at MICE (2000-)

Russian National Committee on Mechanics (2001-)

Member of scientific councils, editorial boards, etc.

Member of the Scientific Committee of MICE (2002-)

Member of the editorial boards

Int. J. Computational, Civil, and Structural Engineering (2001,-)

Bulletin of MICE (2008,-)

Delivered lectures/Courses taught at MICE, MATI, RMI, INSA de Lyon, and IPM:

Strength of materials	(MICE)
Theory of elasticity	(MICE)
Mathematical methods in the theory of vibrations	(MATI, INSA de Lyon)
Mechanics of solids	(MATI)
Theory of seismic waves and NDT	(Rock Mechanics Institute)
Theory of plasticity and viscoelasticity	(MICE)
Fracture mechanics	(MICE)
Methods of wave dynamics	(MICE, INSA de Lyon)
Methods and principles of seismic protection	(INSA de Lyon)
Abaqus®: from FEM to SPH and DEM	(IPM, MICE)

Research and scientific interests:

1. Geophysics, earthquake engineering
 - 1.1 Models for crust and tectonic plates
 - 1.2 Seismic source models: discrete and continuum source models
 - 1.3 Numerical models for seismic wave propagation
 - 1.4. Interaction of seismic waves with structures
 - 1.5. Seismic barriers and seismic pads
2. Wave dynamics (acoustics) and theory of vibrations
 - 2.1 Bulk and surface acoustic waves in media with arbitrary anisotropy
 - 2.2 Propagation of surface acoustic waves in anisotropic multilayered media
 - 2.3 Numerical algorithms for NDT of multilayered media
 - 2.4 Scattering of elastic waves by defects
 - 2.5 Waves in non-linear media
 - 2.6. Seismic waves, modelling of tectonic seismic waves
 - 2.7. Seismic protection
 - 2.8. Vibrations of multibody systems, chaotic dynamics
3. Fracture mechanics of anisotropic solids
 - 3.1 Analytical and numerical modelling of crack growth problems for mixed mode cracks
 - 3.2 Energy criteria for coalescence of microcracks and dislocations
 - 3.3 Interactions of cracks in anisotropic elastic media
4. Physics and mechanics of composite materials
 - 4.1 Methods for homogenization
 - 4.2 Induced anisotropy
 - 4.3 Scattering of elastic waves in heterogeneous media with arbitrary anisotropy
 - 4.4 Microstresses
5. Fundamental solutions for media with arbitrary elastic anisotropy
 - 5.1 Multipolar series for fundamental and singular solution construction
 - 5.2 Regularization algorithms for evaluating hypersingular operators
 - 5.3 Numerically stable algorithms for multipolar series summation

Some of recent scientific research projects:

Russian Fund for Fundamental Research

Grant 02-01-00259 “Impact modelling of bodies with complicated structure” (2002-2004)

Grant 04-01-00781 “Development of theoretical methods for analyzing Love waves propagated in anisotropic media containing nano layers” (2004-2006)

Grant 07-01-12031 “Development of methods for evaluation of vibrations, waves, and fracture of micro and nano fibres” (2007-2008)

Grant 08-01-00021 “Experimental, analytical, and numerical modelling of the fast speed penetration and rupture” (2008-2010)

Grant 08-11-08-00582 “Spatial modelling of seismic barriers” (2011-2013)

Grant 14-08-00719 “Solitary Lamb waves in NDT” (2014-)

Russian Academy of Sciences grants

Grant No. 12 OEMPU, 2003-2006;

Grant No. 43, 2014-

Erasmus Mundus

Master in Mechanical Engineering Program, 2005-2006

Recent publications:

More than 180 scientific publications, including some of the recent

Kuznetsov S.V., Direct boundary integral equation method in the theory of elasticity, *Quart. Appl. Math.*, 1995, vol. 53, No.1, pp. 1-8.

Kuznetsov S.V., Energy and singular solutions in anisotropic elasticity, *C.R. Acad. Sci. Paris*, 1995, vol.321, ser. IIB, pp. 309-314.

Kuznetsov S.V., Fundamental solutions for equations of harmonic vibrations in the theory of elasticity, *C.R. Acad. Sci. Paris*, 1996, vol.322, ser. IIB, pp. 871-878.

Kuznetsov S.V., On the operator of the theory of cracks, *C.R. Acad. Sci. Paris*, 1996, vol.323, ser. IIB, pp. 427-432.

Kaptsov A.V. and Kuznetsov S.V., Spatially periodic fundamental solutions of the theory of vibrations (*in Russian*), *PMM*, 1998, vol. 62, pp. 525-527.

Kuznetsov S.V., “Forbidden” planes for Rayleigh waves, *Quart. Appl. Math.*, 2002, vol.60, No.1, pp. 87-97.

Kuznetsov S.V., Subsonic Lamb waves in anisotropic plates, *Quart. Appl. Math.*, 2002, vol.60, No.3, pp. 577-587.

Kuznetsov S.V., Surface waves of Non-Rayleigh type, *Quart. Appl. Math.*, 2003, vol.61, No.3, pp. 587-592.

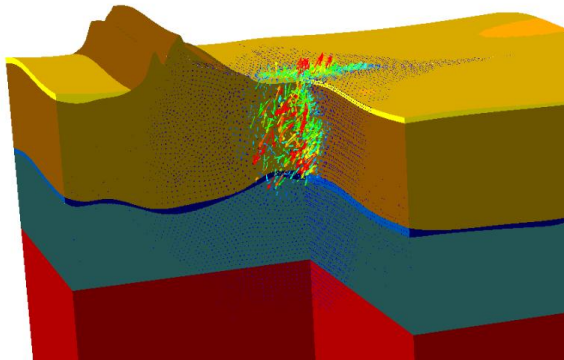
Kuznetsov S.V., Love waves in stratified monoclinic media, *Quart. Appl. Math.*, 2004, vol.62, No.4.

Kuznetsov S.V., Fundamental and singular solutions of equilibrium equations for media with arbitrary elastic anisotropy, *Quart. Appl. Math.*, 2005, vol.63, No.3, pp. 455-467.

- Djeran-Maigre I. and Kuznetsov S.V., Surface waves on a half-space with cubic symmetry, *Int. J. Comp. Civil & Struct. Eng.*, 2005, vol.2, No.2. pp. 21-27.
- Kuznetsov S.V., Djeran-Maigre I., Homogenized Poisson's ratio of porous media, *Int. J. Comp. Civil & Struct. Eng.*, 2005, vol.1, No.1, p. 59-64.
- Kuznetsov S.V., Love waves in monoclinic media (in Russian), *PMM*, 2006, vol.70, No.1, 141-154.
- Kuznetsov S.V., SH-waves in laminated plates, *Quart. Appl. Math.*, 2006, vol.64, No.1, pp.153-165.
- Kuznetsov S.V., Djeran-Maigre I., Scattering of elastic waves in dispersed composites, *Int. J. Computational Civil and Structural Engineering*, 2007, vol.2, iss.1, pp. 52-57.
- Djeran-Maigre I. and Kuznetsov S.V., Solitary SH waves in two layered traction free plates, *Comptes Rendus Acad. Sci., Paris, Ser. Mecanique*, №336 (2008) pp. 102-107.
- Kuznetsov S.V., Soliton-like Lamb waves in anisotropic layers (in Russian), *PMM*, 2009, vol.73, No. 1, pp. 141-154.
- Kuznetsov S.V., Love waves in nondestructive diagnostics of layered composites. Survey, *Acoustical Physics*, 2010, vol. 56, No.6., pp. 877-892.
- Kuznetsov S.V., Seismic waves and seismic barriers, *Acoustical Physics*, 2011, vol.57, pp. 420-426.
- Djeran-Maigre I., Kuznetsov S.V. Soliton-like Lamb waves in layered media, In: *Waves in Fluids and Solids*, Edited by Ruben Pico Vila, InTech Publisher, 2011, pp. 53-67. ISBN 978-953-307-285-2. 2011-03
- Kravtsov A.V., Kuznetsov S.V., Sekerzh-Zenkovich S.Ya., Finite Element Models in Lamb's Problem, *Mech. Solids.*, 2011, vol. 46 (6), pp. 952-959.
- Kuznetsov S.V. Cauchy Six-Dimensional Formalism for Lamb Waves in Multilayered Plates. *ISRN Mechanical Engineering* 2013(2): 1-11.
- Kuznetsov S.V., Lamb waves in anisotropic plates (review), *Acoustical Physics*, 2014, vol.60, pp. 95-103.
- Kuznetsov S.V. Scattering of elastic waves in periodic media, *Int. J. Latest Research in Science and Technology*, 2014, vol. 3, No.4, pp. 61-64.
- Kuznetsov S.V., Terentjeva E.O., Planar Internal Lamb Problem: Waves in the Epicentral Zone of a Vertical Power Source, *Acoustical Physics*, 2015, Vol. 61, No. 3, pp. 356–367.
- Kuznetsov S.V., Terentjeva E.O. Wave fields and domination regions for the interior Lamb problem. *Mechanics of Solids*. 2015. 50(5): 508-520.
- Goldstein R.V., Kuznetsov S.V., Khudyakov M.A. Study of forced vibrations of the Kelvin-Voigt model with an asymmetric spring. *Mechanics of Solids*, 2015, 50 (3), 294-304.
- Goldstein R.V., Kuznetsov S.V. Continuum models in dynamics of granular media. Review (in Russian). *Computational Mechanics of Solid Media*. 2015: 8(1) 35-59.
- Kaptsov A.V., Kuznetsov S.V. Love waves in a three-layer elastic half-space. *J. Appl. Math. & Mech.*, 2016, vol. 80, No.1

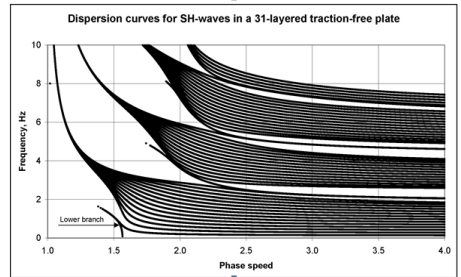
Some of the recent projects:

Tectonic earthquake simulations



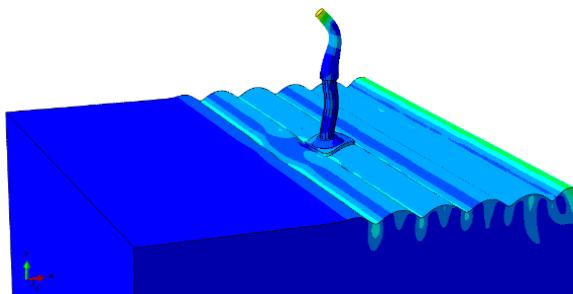
Large geophysical model of the tectonic earthquake. Study of initiation and propagation of seismic waves; FEM; explicit dynamics

Development of a six-dimensional formalism for analysis of Love, SH, and Lamb wave dispersion in anisotropic layered structures

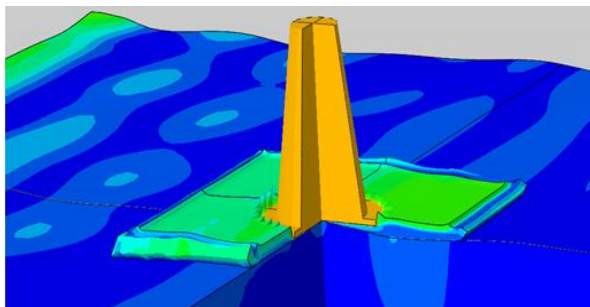


Dispersion of SH waves propagating in a 31-layered anisotropic plate (Cauchy 6D-formalism)

Rion-Antirion bridge in Southern Greece. Seismic analysis of the bridge pylons and the foundation

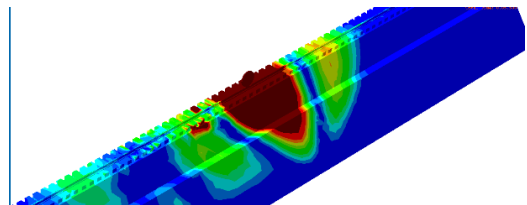
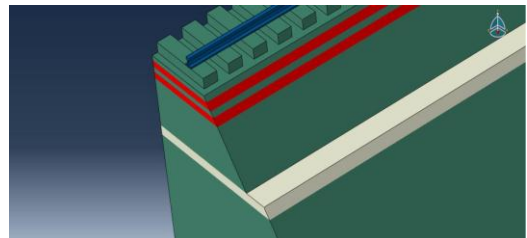


Action of seismic waves on the pylon



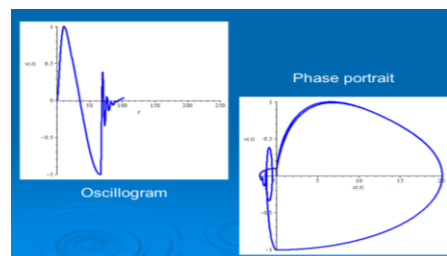
Study of the gravel pad and basement of the pylon (gravel pad modelled with the Modified Cam-Clay + SPH)

Analysis of wave fields in the transition zone near a railroad abutment from moving load



Waves propagation in a system[^] rail-slipper-gravel-reinforcing geogrid-sand-soil (FEM, explicit dynamics)

Analysing initiation of chaotic vibrations in a dynamic system with nonlinear characteristics



The transition regime when chaotic vibrations begin to appear (system with dry friction element)