C U R R I C U L U M V I T A E
of Sergey I. Repin

1. **Personal data**

Repin Sergey Igorevich, born July 18, 1953, married.
Office address
V.A Steklov Institute of Mathematics in St.-Petersburg,
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2. **Scientific degrees.**

Ph.D. in physics and mathematics (1983). Leningrad Polytechnical Institute, Physical–Mechanical Faculty.

Thesis: *Shape optimization of elastic bodies for eigenvalue problems.*

Dr. Sci. in physics and mathematics (1994). St.-Petersburg State University, Mathematical–Mechanical Faculty.

Thesis: *Variational-difference methods for mathematical problems of plasticity theory.*

3. **Employment.**

Deputy Director of V.A. Steklov Institute of Mathematics in St.-Petersburg of Russian Academy of Sciences.
Professor of the Chair of Applied Mathematics in St.-Petersburg Polytechnical University.

4. **Membership in Professional Organizations.**

Member of American Mathematical Societies. Member of St.-Petersburg Mathematical Society. Member of the editor board of
Russian Journal of Numerical Analysis and Mathematical Modelling.

5. **Main lecture courses.**

1. Mathematical and numerical methods in continuum mechanics.
2. Error analysis for approximate solutions of PDE's; a priori and a posteriori
   estimates.
3. Functional analysis.
4. Calculus of variations. Convex analysis and duality theory.

6. **Scientific directions.**

- Numerical methods for partial differential equations, a priori and a posteriori error estimates.
- Mixed finite element methods. Mixed approximations on distorted meshes.
- Nonlinear variational problems in the mechanics of solids (problems with obstacles and friction, elasto–plasticity, phase transitions in solids, advanced models in the theory of plates).
- Problems in the theory of viscous incompressible fluids, functional a posteriori estimates for Newtonian and generalized Newtonian fluids.
- Duality theory in the calculus of variations and its applications to numerical analysis.
- Problems with nondifferentiable and nonconvex functionals, optimization problems.

7. **Participation in national and international research programs.**

- 1994: International Science Foundation (ISF),
  Grant N^o MLROOO, (participant);
- 1994: Russian Foundation for Basic Research (RFBR),
  Grant N^o 94-0100120a, (principal investigator);
- 1994: International Association for the Promotion of Cooperation with Scientists from the Independent States of the Former Soviet Union (INTAS), Grant N^o 94-1386, (participant);
- 1995: ISF, Grant N^o MLR3OO, (participant);
- 1996: Fellow of the Royal Society of London, (personal 6 months research grant);
- 1996: RFBR, Grant N^o 96-0101664, (principal investigator);
- 1996-1998: State Committee of Higher Education of Russia,
  Grant N 95-0-2.2-14, (principal investigator).
- 1997-1999 : INTAS, Grant N 96-835, (team leader);
- 2000: Grant of the Academy of Finland, (personal 2 months research grant);
- 2001-2004: Research grants and programs of the Academy of Finland and University of Jyuväskylä (3 month per year);
- 2002-2004: Research grant of Swiss Academy, Institute of Mathematics, Zurich University (participant);

- 2002-2003: Research program of the Mathematical Department of the University of Houston supported by the grant of Los Alamos National Laboratory (LACSI/LANL), USA (visiting researcher);
- 2004: Research program of the Mathematical Department of the University of Houston supported by the grant of Los Alamos National Laboratory (LACSI/LANL), USA (visiting researcher);
- 2004-2005: Research grant of U.S. Civilian Research and Development Foundation (CRDF) between V. A. Steklov Institute of Mathematics in St.-Petersburg and Arizona State University, USA, RU-M1-2596-ST-04, 2004–2005 (participant);
- 2005: Research program of the Mathematical Department of the University of Houston supported by the grant of Los Alamos National Laboratory (LACSI/LANL), USA (visiting researcher);
- 2005-2006: TEKES grant, Finland, (participant).

8. Visiting

- 1995-1996: Westminster University of Central London, UK (9 months);
- 1997: Institute for Structural and Computational Mechanics, University of Hannover, Germany (2 weeks);
- 1998: University of Heidelberg, Germany (2 weeks);
- 2000: University of Jyuväskylä, Finland (2 months);
- 2000: University of Saarbrucken, Germany (1 month);
- 2001: University of Jyuväskylä, Finland (2 months in total);
- 2002: University of Houston, TX, USA (1 month);
- 2002: University of Jyuväskylä, Finland (3 months in total);
- 2003: University of Houston, TX, USA (3 month);
- 2003: University of Jyuväskylä, Finland (3 months in total);
- 2004: University of Houston, TX, USA (3 month);
- 2003: University of Jyuväskylä, Finland (3 months in total);
- 2005: Special Researcher of the Department of Mathematical Information Technology of the University of Jyuväskylä, Finland;
- 2005: University of Houston, TX, USA (2 month);
- 2005: University of Saarbrucken, Germany (visiting professor, 3 months);
- 2005: Radon Institute for Computational and Applied Mathematics, Austrian Academy of Sciences, Linz, Austria (visiting professor, 3 months);
- 2006: Swiss Federal Institute of Technology (ETH), Zurich, (visiting professor, 3 months);
- 2006: Helsinki University of Technology (visiting professor, 4 months);

9. Invited Lectures

- 1995: *International Workshop Mathematical Problems in Nonlinear Mechanics and Physics*, V. A. Steklov Inst. of Math. in St.-Petersburg, Russia Sept. 25 - Oct. 7, 1995;
- 1997: *International Saint–Venant Symposium "Multiple scale analysis and coupled physical systems"*, Paris, 28–29 August 1997;
- 1997: Institute for Structural and Computational Mechanics, University of Hannover, Germany;
- 1997: Mathematical Institute A, University of Stuttgart, Germany;
- 1998: *International Conference "Analysis and Approximation of Boundary Value Problems"*, Jyuväskylä,Finland 15–16, 1998;
- 1998: Mathematical Institute A, University of Stuttgart, Germany;
- 1998: *International Workshop "Adaptive Finite Element Methods and Optimization (AFEMOPT98)"*, Heigelberg, Germany, October 19-20, 1998;
- 1999: *GAMM Workshop "Computational Plasticity"*, Kiel, Germany, August 27–29, 1999;
- 2000: *5th French–Russian–Finnish Workshop on Experimentation, Mathematical Modeling and Computation*, Jyuväskylä, June 26–28, 2000;
- 2000: *International Conference"FEM for 3D problems"*, Jyuväskylä, Finland,June 28–30, 2000;
- 2002: University of Houston, TX, USA;
- 2002: Institute of Mathematics, University of Zurich, Switzerland;
- 2003: University of Houston, TX, USA;
- 2003: Faculty of Mathematics, University of Augsburg, Germany;
- 2003: Mathematical Institute A, University of Stuttgart, Germany:
- 2003: Institute of Numerical Mathematics, Russian Academy of Sciences, Moscow;
- 2004: European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2004), Jyväskylä, 24-28 July 2004;
- 2004: Institute of Mathematics, University of Zurich, Switzerland;
- 2004: University of Houston, TX, USA;
- 2004: Texas A&M University, College Station, TX, USA;
- 2005: Faculty of Mathematics, University of Saarbrucken, Germany;
- 2005: University Paris 6, J.-L. Lions Laboratory;
- 2005: Mathematical Department of Arizona State University, Arizona, USA;
- 2005: International conference "Advances in Numerical Mathematics" dedicated to Prof. Yu. Kuznetsov, Moscow, September 16-17, 2005;

- 2005: The Sixth European Conference on Numerical Mathematics and Advanced Applications, Santiago de Compostela, Spain, July 18-22, 2005;
- 2005: International Workshop "Direct and Inverse Field Computations in Mechanics", University of Linz, November 7-11, 2005;
- 2005: SCOMA International Seminar on Innovative Scientific Computing, University of Jyväskylä, October 3-5, 2005;
- 2005: Special Radon Semester in Radon Institute for Computational and Applied Mathematics (RICAM), Linz, (14 lecture course for PhD. Students and Post. Doctors);
- 2006: Department of Mathematics, University of Zurich, April 2006;
- 2006: 2d SCOMA International Seminar on Innovative Scientific Computing, Helsinki University of Technology, Espoo, November 23-24, 2006;
- 2006: Expert meeting. FWF Program for Mathematical and Computational Science, Austrian Academy of Sciences, Vienna September 26–28, 2006.

10. Participation in International Conferences

- *International Conference on Differential Equations and Applications (EQADIFF 8)*, Comenius University, Bratislava, Slovak Republic Aug. 24–28 1993;
- *International Conference on Difference Equations*, Trinity University, Texas, USA May 24–26, 1994;
- *2-nd International Conference "Numerical Methods in Continuum Mechanics"*, Charles University, Prague, Czech Republic, Aug. 22–26, 1994;
- *International Workshop Set-Valued Calculus and Nonsmooth Analysis*, V.A. Steklov Inst. of Math. in St.-Petersburg, Russia, May 29 – June 9, 1995 (co-organizer);
- *International Conference Optimization of Finite Element Approximations (OFEA95)*, 1995, St.-Petersburg University, St.-Petersburg, Russia June 26–29 (co-organizer);
- *International Congress on Industrial and Applied Mathematics (ICIAM95)*, Hamburg, Germany July 2-7, 1995;
- *International Symposium on Numerical Methods and Error Bounds*, Oldenburg University, Germany, July 9-12, 1995;
- *Second European Conference on Numerical Mathematics and Advanced Applications (ENUMATH 97)*, Heidelberg, Germany, 28 Sept. – 3 Oct. 1997;
- *3-d International Conference "Numerical Modelling in Continuum Mechanics"*, Prague, Czech Republic, Sept. 8–11 1997;

- *The first IMACS Conference on Mathematical Modelling and Computational Methods in Mechanics and Geodynamics*, Prague, Czech Republic, July 7–11, 1998;
- *Third European Conference on Numerical Mathematics and Advanced Applications (ENUMATH 99)*,
- *International Petrovski Conference on Differential Equations* , Moscow, May 21-27,2001;
- International Conference on Navier-Stokes Equations and Related Topics (NSEC8), St.-Petersburg September 11-18, 2002 (co–organizer),
- *Texas Finite Element Rodeo 2003*, University of Houston, March 1-2, 2002, TX, USA;
- *International Workshop on Reliable Methods of Mathematical Modeling*, Jyuväskylä, Finland, September 25–27, 2003 (co–organizer),
- *5th European Conference on Numerical Mathematics and Advanced Applications (ENUMATH 2003)*, Prague, 12 – 19 Aug. 2003;
- *International Petrovski Conference on Differential Equations* , Moscow, May 17-22,2004;
- *Texas Finite Element Rodeo 2004*, University of Texas at Austin, March 2-3, 2003 TX, USA;
- *Texas Finite Element Rodeo 2005*, Southern Methodist University, March 4-5, Dallas, TX;
- *Second International Workshop on Reliable Methods of Mathematical Modeling*, University of Zurich, July 6-8, 2005 (co-organizer);
- *International conference on Adaptive Modeling and Simulation, ADMOS 2005*, Barselona, September 8-10, 2005;
- *Workshop on Error Analysis Methods* , Radon Institute for Computational and Applied Mathematics (RICAM), November 15, 2005;
- *Finite Element Fair*, Zurich, 2006.

LIST OF MAIN PUBLICATIONS

(1) S. Repin. A posteriori error estimation for nonlinear variational problems by duality theory. *Zapiski Nauchn. Semin. POMI*, 243 (1997), 201–214.

(2) S. Repin. A posteriori error estimation for variational problems with uniformly convex functionals. *Mathematics of Computations*, 69 (2000), 230, 481–500.

(3) S. Repin. Two-sided estimates of deviation from exact solutions of uniformly elliptic equations. *Amer. Math. Soc. Transl. Series 2*, 209 (2003), 143–171.

(4) P. Neittaanmäki and S. Repin. *Reliable methods for computer simulation. Error control and a posteriori estimates*, Elsevier, New York, 2004.

(5) M. Fuchs and S. Repin. Estimates for the deviation from the exact solutions of variational problems modeling certain classes of generalized Newtonian fluids, *Math. Meth. Appl. Sci.*, 29 (2006), pp. 2225–2244.

(6) M. Bildhauer, M. Fuchs and S. Repin. A posteriori error estimates for stationary slow flows of power–law fluids, Journal of Non-Newtonian Fluid Mechanics (in press).

(7) S. Repin. Functional Approach to Locally Based A Posteriori Error Estimates for Elliptic and Parabolic Problems, Proc. 6th European Conference on Numerical Mathematics and Advanced Applications, Springer, Berlin, 2006, 133-148.

(8) S. Repin. Functional a posteriori estimates for the Maxwell's problem, *J. Math. Sci. New York*, 142(2007), 1, 1821–1827.

(9) R. Lazarov, S. Repin, and S. Tomar. Functional A Posteriori Error Estimates for Discontinuous Galerkin Approximations of Elliptic Problems, Preprint 2006-40, RICAM Linz, 2006.

(10) S. Repin, J. Valdman. Functional a posteriori error estimates for problems with nonlinear boundary conditions, Preprint 2006-25, RICAM Linz, 2006.

(11) S. Repin. Local a posteriori estimates for the Stokes problem. Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI) 318 (2004), Kraev. Zadachi Mat. Fiz. i Smezh. Vopr. Teor. Funkts. 35, 233–245.

(12) A. Gaevskaya and S. Repin. A posteriori error estimates for approximate solutions of linear parabolic problems. *Differential Equations*, 41 (2005), 7, 970–983.

(13) S. Repin and A. Smolianski. Functional-type a posteriori error estimates for mixed finite element methods. *Russian J. Numer. Anal. Math. Modelling* 20 (2005), no. 4, 365–382.

(14) S. Repin, S. Sauter, and A. Smolianski. *Two-Sided A Posteriori Error Estimates for Mixed Formulations of Elliptic Problems,* Preprint 21-2005, Institute of Mathematics, University of Zurich, to appear in *SIAM J. Appl. Math.*

(15) A. Gaevskaya, W. H. Hoppe, and S. Repin. A posteriori estimates for cost functionals of optimal control problems, Proceedings of 6th European Conference on Numerical Mathematics and Advanced Applications, Springer, Berlin, 2006, 291–298.

(16) E. Gorshkova, P. Neittaanmaki, and S. Repin. Comparative study of a posteriori error estimates for the Stokes problem, Proc. of 6th European Conference on Numerical Mathematics and Advanced Applications, Springer, Berlin, 2006, 255-262,

(17) M. Frolov, P. Neittaanmaki, and S. Repin. Guaranteed functional error estimates for the Reissner-Mindlin plate problem, *J. Math. Sci (New York)*, 132 (2006), 4, 553-561,

(18) M. Bildhauer and S. Repin, Estimates for the deviation from exact solutions of variational problems with power growth functionals, Zapiski Nauchnych Seminarov POMI 336(2006), 5-24.

(19) S. Repin. A posteriori estimates in local norms. Problems in mathematical analysis. No. 29. J. Math. Sci. (N. Y.) 124 (2004), no. 3, 5026–5035.

(20) S. Repin and S. Sauter. Functional a posteriori estimates for the reaction-diffusion problem, *C. R. Acad. Sci. Paris, Ser. 1*, 343(2006), 349–354.

(21) Yu.Kuznetsov and S.Repin. Convergence analysis and error estimates for mixed finite element method on distorted meshes. *Journal of Numerical Mathematics*, Vol.13, No.1, 2005, 22–51.

(22) S. Repin, S. Sauter and A. Smolianski. A posteriori estimation of dimension reduction errors for elliptic problems in thin domains. *SIAM J. Numer. Anal.*, 42 (2004), no. 4, 1435–1451.

(23) S. Repin, S. Sauter and A. Smolianski. A Posteriori Control of Dimension Reduction Errors on Long Domains. *Proceedings in Applied Mathematics and Mechanics*, 4, No. 1, 714–715 (2004).

(24) S. Repin, S. Sauter and A. Smolianski. A posteriori error estimation for the Poisson equation with mixed Dirichlet/Neumann boundary conditions. Proceedings of the 10th International Congress on Computational and Applied Mathematics (ICCAM-2002). *J. Comput. Appl. Math.* 164/165 (2004), 601–612.

(25) M. Frolov, P. Neittaanmäki and S. Repin. Guaranteed functional error estimates for the Reissner-Mindlin plate problem. J. Math. Sci. New York, 132 (2006), 4, 553-561.

(26) S. Repin. Estimates of deviations from exact solutions for some boundary–value problems with incompressibility condition. *Algebra and Analiz*, 16(2004), 5, 124–161 (in Russian).

(27) S. Repin, S. Sauter and A. Smolianski. A posteriori estimation of dimension reduction errors. In *Numerical mathematics and advanced applications*, Springer, Berlin, 2004, 717–725.
(28) M. Frolov, P. Neittaanmäk and S. Repin. On computational properties of a posteriori error estimates based upon the method of duality error majorants. In *Numerical mathematics and advanced applications*, Springer, Berlin, 2004, 346–357.
(29) S. Repin, S. Sauter and A. Smolianski. A posteriori error estimation for the Dirichlet problem with account of the error in approximation of boundary conditions. *Computing*, (2003), n.3, 147-168.
(30) S. Repin. A posteriori error estimates with account of indeterminacy of the problem data. *Russ. J. Numer. Anal. Math. Modelling*, 18 (2003), n. 6, 507-519.
(31) Yu. Kuznetsov and S. Repin. New mixed finite element method on polygonal and polyhedral meshes. *Russian J. Numer. Anal. Math. Modeling*, 18(2003), no. 3, 261–278.
(32) Yu. Kuznetsov and S. Repin. Mixed finite element method on polygonal and polyhedral meshes. In *Numerical mathematics and advanced applications*, Springer, Berlin, 2004, 615–622.
(33) A. Muzalevsky and S. Repin. On two-sided error estimates for approximate solutions of problems in the linear theory of elasticity. *Russian J. Numer. Anal. Math. Modelling*, 18 (2003), no. 1, 65–85.
(34) S. Repin, Estimates of deviations for generalized Newtonian fluids. *Zapiski Nauchn. Semin. V.A. Steklov Mathematical Institute in St.-Petersburg (POMI)*, 288(2002), 178–203.
(35) S. Repin. Estimates of deviations from exact solutions of initial–boundary value problem for the heat equation. *Rend. Mat. Acc. Lincei*, 13(2002), s.9, 121-133.
(36) S. Repin. A posteriori estimates for the Stokes problem. *J. Math. Sci. (New York)*, 109 (2002), no. 5, 1950–1964.
(37) S. Repin and M. Frolov. An estimate for deviations from the exact solution of the Reissner-Mindlin plate problem. (Russian) Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI) 310 (2004), 145–157.
(38) S. Repin and M. Frolov. A posteriori error estimates for approximate solutions of elliptic boundary value problems. *Computational Mathematics and Mathematical Physics*, 42(2002), n. 12, 1704-1716.
(39) P. Neittaanmäki and S. Repin. A posteriori error estimates for boundary–value problems related to the biharmonic operator.*East-West J.Numer. Math.*, 9 (2001), 2, 157-178.
(40) S. Repin. Estimates for errors in two-dimensional models of elasticity theory. *J. Math. Sci. (New York)*, 106 (2001), 3, 3027–3041.
(41) S. Repin . A posteriori estimates of the accuracy of dimensional reduction models in 3-D elasticity theory. In *Finite element methods*

(Jyvaskyla, 2000), 240–253, GAKUTO Internat. Ser. Math. Sci. Appl., 15, Gakkotosho, Tokyo, 2001.

(42) S. Repin. Estimates of deviations from exact solutions of elliptic variational inequalities. *Zapiski Nauchn. Semin. V.A. Steklov Mathematical Institute in St.-Petersburg (POMI)*, 271 (2000), 188–203.

(43) H. Buss and S. Repin. A posteriori error estimates for boundary–value problems with obstacles. In *Proceedings of 3nd European Conference on Numerical Mathematics and Advanced Applications, Jyuvaskyla, 1999*,162–170, World Scientific, 2000.

(44) S. Repin. A posteriori estimates of the accuracy of variational methods for problems with nonconvex functionals.*Algebra i Analiz*, 11 (1999), 4151–182 (in Russian, translated in *St.-Petersburg Mathematical Journal*, v.11, 4, 2000).

(45) S. Repin. A posteriori error estimation for approximate solutions of variational problems by duality theory. In *Proceedings of 2nd European Conference on Numerical Mathematics and Advanced Applications,Heidelberg, 1997*, 524–531, World Scientific, 1999.

(46) S. Repin. A unified approach to a posteriori error estimation based on duality error majorants. *Mathematics and Computers in Simulation* 50 (1999), 313–329.

(47) S. Repin. A posteriori estimates for approximate solutions of variational problems with strongly convex functionals. *Problems of Mathematical Analysis*, 17 (1997), 199–226. (in Russian). English translation in *J. Math. Sci. (New York)* , 97 (1999), 4, 4311–4328.

(48) S. Repin. A posteriori error estimation for problems with power growth functionals. *Zapiski Nauchn. Semin. POMI*, 249 (1997), 244–255.

(49) S. Repin and L. Xanthis. A posteriori error estimation for nonlinear variational problems. *C. R. Acad. Sci. Paris*, 324 (1997), Serie I, 1169–1174.

(50) S. Repin. Mathematical and numerical analysis of discontinuous solutions in plasticity theory. In *Proceedings of Saint-Venant Symposium, Paris, 1997*, 365-372.

(51) S. Repin. Errors of finite element method for perfectly elasto-plastic problems. *Math. Models. Meth. Appl. Sci. (M^3AS)*, 6 (1996), 587–604.

(52) S. Repin and L. Xanthis. A posteriori error estimation for elasto-plastic problems based on duality theory. *Comput. Methods Appl. Mech. Engrg.*, 138 (1996), 317-339.

(53) S. Repin and G. Seregin. Existence of a weak solutions of the minimax problem in Coulomb-Mohr plasticity. In *American Mathematical Society Translations*, Series 2, 164 (1995), 189-220.

(54) S. Repin and G. Seregin. Error estimates for stresses in the finite element analysis of the two-dimensional elasto-plastic problems. *Int. J. Engrg. Sci.,* 33 (1995), 2, 255-268.

(55) S. Repin. A priori error estimates of variational-difference methods for Hencky plasticity problems. *Zapiski Nauchn. Semin. POMI*, 221 (1995), 226-234.

(56) S. Repin. On the Approximations of Discontinuous Solutions of some Problems in Nonlinear Mechanics and Geometry. In *Proceedings of the First International Conference on Difference Equations, 1994, San-Antonio, USA*, 1995, Gordon & Breach, 439-458.

(57) S. Repin. Errors of variational-difference methods for perfectly elasto-plastic problems. In *Numerical Modeling in Continuum Mechanics, Proc. II Int. Conf. Numer.Modell. in Contin. Mech.,1994, Prague, Czech Republic*, Charles University Press, 1995, 228-234.

(58) P. Neittaanmäki, S. Repin and V.Rivkind. Discontinuous finite element approximations for functionals with linear growth. *East-West J.Numer.Math.*, 2 (1994), 3, 212-228.

(59) S. Repin. The solutions of problems in the mathematical theory of plasticity with discontinuities in the displacement fields. *J. Appl. Maths. Mechs.*, 58 (1994), 149-160.

(60) S. Repin. Numerical analysis of no nonsmooth variational problems of perfect plasticity. *Russ. J. Numer. Anal. Math. Modell.*, 9 (1994), 33-46.

(61) S. Repin. On the approximations of solutions to variational problems of perfect plasticity. *Transactions of Higher Educational Institutions (Mathematics)*, 1994, 9, 60-69 (in Russian).

(62) S. Repin. Variational statements of ideal plasticity problems for discontinuous fields of displacements. *Reports USSR Academy of Sciences*, 320 (1991), 6, 1340-1344 (in Russian).

(63) P. Neittaanmäki, S. Repin and V. Rivkind. Conforming finite element methods using discontinuous approximations. *Jyväskylä-St.Petersburg Seminar on Partial Differential Equations and Numerical Methods,Ber.Univ.Jyväskylä Math. Inst.* 56 (1993), 63-88.

(64) S. Repin. On the variational formulations using discontinuous displacements fields for problems of perfect plasticity. *Prikl. Maths. Mechs.*, 55 (1991), 6, 1026-1034.

(65) S. Repin. Variational-difference method for solving problems with functionals of linear growth. *Zh.Vychisl. Mat. i Mat. Fiz.*, 28 (1989), 3, 693-708 (in Russian, translated in *USSR Comp. Maths. Math. Phys.*).

(66) S. Repin. Variational-difference method for problems of perfect plasticity using discontinuous conventional finite elements method. *Zh. Vychisl. Mat. i Mat. Fiz.*, 28 (1988), 449-453 (in Russian).

(67) S. Repin. Minimization of a class of nondifferentiable functionals by means of relaxation methods. *Zh. Vychisl. Mat.i Mat. Fiz*, 27 (1987), 976-983 (in Russian, translated in *USSR Comp. Maths. Math. Phys.*).