



Professor Sergei B. Filippov

See:

<http://tm-math.spbu.ru/pages/sbf/english.htm>

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Department of Theoretical and Applied Mechanics, Mathematics and Mechanics Faculty Saint-Petersburg State University, Russia

Education:

The degree of Doctor of Science in Mechanics of solids from St. Petersburg State University in 1994 for the thesis: Vibrations and buckling of joined and stiffened shells.

Ph.D. in Mechanics of solids from the same university in 1975 for the thesis: Free vibrations of the thin shells of revolution.

Graduated in Applied Mathematics from the same university in 1970.

Research Interests:

The evaluation of vibration frequencies and critical loads for thin elastic shells by means of asymptotic and numerical methods.

More than 70 papers published.

Selected Publications:

Books:

Svetlana M. Bauer, Sergei B. Filippov, Andrei L. Smirnov, Petr E. Tostik and Rémi Vaillancourt, *Asymptotic Methods in Mechanics of Solids*, International Series of Numerical Mathematics, Vol. 167, Birkhäuser Basel, 2015, 325 pages

Journal Articles, etc.:

S.M. Bauer, S.B. Filippov, A.L. Smirnov, P.E. Tovstik, *Asymptotic Methods in Mechanics with Application to Thin Shells and Plates*, *Asymptotic Methods in Mechanics. CRM Proceeding and Lecture Notes*. Amer. Math. Soc., Providence 1993, p. 3-141

S.M. Bauer, S.B. Filippov, A.L. Mayboroda, A.L. Smirnov, I.Yu. Teterin, *Buckling of thin cylindrical shells and shells of negative Gaussian curvature*, *Asymptotic Methods in Mechanics. CRM Proceeding and Lecture Notes*. Amer. Math. Soc., Providence 1993, p.153-162

S. B. Filippov, *The stability of cylindrical shells, joined at an angle under the action of a uniform external pressure*, *Prikl. Mat. Mech.*, 1995, vol. 59, no. 1, 140-148; English transl., *J. Appl. Math. Mech.* 1995, vol. 59, no. 1, 129-137.

Sergei Filippov, “*Buckling of a stiffened pipe bend under an external pressure action*”, April 1996

S. B. Filippov, *Application of asymptotic methods for the evaluation of the optimal parameters for the ring-stiffened cylindrical shells*, *Integral methods in science and engineering*, UK, vol 2, 1997, 79-83

S. B. Filippov, *Theory of joined and stiffened shells*, St. Petersburg State University Press, St. Petersburg, 1999 (in Russian).

A.L. Lopatukhin and Sergei Filippov, “*On stability of thin conical reinforced shell under uniform external pressure*”, January 1999

S. B. Filippov, E. Haseganu, A. L. Smirnov, *Vibrations of a Square Elastic Tubes with a Free Edge //Mechanics Research Communications*. 2000, 27(4), 457-464.

Sergei B. Filippov, Eliza M. Haseganu and Andrei L. Smirnov, “*Free vibrations of square elastic tubes with a free end*”, *Mechanics Research Communications*, Vol. 27, No. 4, pp 457-464, 2000

S.B. Filippov, E.M. Haseganu and A.L. Smirnov, “*Buckling analysis of axially compressed square elastic tubes with weakly supported edges*”, *Technische Meckanik*, Vol. 20, No. 1, pp 13-20, 2000

A.L. Lopatukhin and Sergei Filippov, “*Low frequency vibration and buckling of the ring stiffened thin cylindrical shell*”, January 2001

Eliseeva, L. S.; Filippov, S. B.: *Buckling and vibrations of cylindrical shell of variable thickness with slanted edge [in Russian]*. *Vestnik Sankt-Peterskogo Universiteta*, 3, (2003), 84–91.

Sergei Filippov and Eliza M. Haseganu, “*Low frequency vibrations of a thin cylindrical shell joined with an annular thin plate*”, *Transactions- Canadian Society for Mechanical Engineering* 27(3):183-192 · June 2003

S.B. Filippov, “*Optimal design of stiffened cylindrical shells based on an asymptotic approach*”, *J. Technishe Mechanik*, 24 (2004), pp. 221-230

S. B. Filippov, D. N. Ivanov, N. V. Naumova, “*Free Vibrations and Buckling of a Thin Cylindrical Shell of Variable Thickness with Curvilinear Edge*”, *Technische Mechanik*, Band 25, Heft 1, (2005), 1– 8

S. B. Filippov, *Buckling of cylindrical shell joint with annular plate // Shell Structures Theory and Applications*, Proc. of the 8th SSTA Conference. Jurata, Poland, 2005, 211-214.

S.B. Filippov, *Buckling, vibrations and optimal design of ring-stiffened thin cylindrical shells*, in: *Advances in Mechanics of Solids*. World Scientific Publishing Co Ltd., 2006, pp. 17–48.

Sergei Filippov, “*Buckling of circular ring joint with cylindrical shell*”, Chapter in *Shell Structures: Theory and Applications*, Vol. 2, pp 109-112, September 2009

S.B. Filippov, M. Kolyada, *Numerical and Asymptotic Modeling of Annular Plate Vibrations*, in: I. Dimov, I. Farago, L. Vulkov (Eds.) *NAA 2012*, Springer-Verlag Berlin Heidelberg, 2013, pp. 295–302.

Sergei B. Filippov and Natalia V. Naumova, “*Optimal design of vibrating ring-stiffened cylindrical shell*”, *COMPADYN 2013*, 4th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics

and Earthquake Engineering, M. Papadrakakis, N.D. Lagaros and V. Plevris (Editors), Kos Island, Greece, 12-14 June 2013

Sergei Filippov and Natalia V. Naumova, "Vibrations and buckling of cylindrical shell made of a general anisotropic elastic material", DOI: 10.1201/b15684-71 , January 2014

Sergei B. Filippov, "Stiffened shell of minimal weight in buckling problems", AIP Conference Proceedings 1648, 300003 (2015), 22-28 September 2014, Rhodes, Greece

Sergei Filippov and Petr E. Tovstik, "Advanced Structured Materials", Chapter in Shell and Membrane Theories in Mechanics and Biology: From Macro- to Nanoscale Structures, pp 169-186, January 2015

M. L. Boyarskaya and S. B. Filippov, "Buckling of cylindrical shell stiffened by rings with T-shaped cross-section," Vestn. S.-Peterb. Univ., Ser. 1: Mat., Mekh., Astron. 60 (3), 431–442 (2015).

I.A. Adamovich and Sergei Filippov, "Optimizations of parameters of a stiffened cylindrical shell", *Vestnik St Petersburg University Mathematics* 48(2):102-108 · April 2015

Boyarskaya, M.L. & Filippov, S.B., "Buckling analysis of a ring under the action of internal pressure in a cylindrical shell", *Vestnik St. Petersburg Univ. Math.* (April 2016) 49, 2: 166-173.

<https://doi.org/10.3103/S1063454116020035>, Original Russian Text: M.L. Boyarskaya, S.B. Filippov, 2016, published in *Vestnik Sankt-Peterburgskogo Universiteta. Seriya 1. Matematika, Mekhanika, Astronomiya*, 2016, No. 2, pp. 266–275.

Sergei B. Filippov and Maria L. Boyarskaya, "Buckling of annular plate joint with circular beam", ECCOMAS Congress 2016, VII European Congress on Computational Methods in Applied Sciences and Engineering, M. Papadrakakis, V. Papadopoulos, G. Stefanou and V. Plevris (editors), Crete, Greece, 5-10 June 2016

Sergei Filippov, "Low-frequency vibrations of thin cylindrical shell stiffened by rings with T-shaped cross-section", 6th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering, January 2017

Sergei B. Filippov (St. Petersburg State University, 7/9 Universitetskaya emb., St. Petersburg, 199034, Russia), "Asymptotic and numerical analysis of free low-frequency ring-stiffened shells vibrations", *Procedia Engineering*, Vol. 199, pp 342-347, 2017

Sergei Filippov, "Solving equations of free vibration for a cylindrical shell rotating on rollers by the Fourier method", *Vestnik St Petersburg University Mathematics* 51(2):182-191 · April 2018

Sergei Filippov, "Low-frequency vibrations of a cylindrical shell rotating on rollers", AIP Conference Proceedings, Vol. 1959, No. 1, 070011, May 2018