14th World Congress on Computational Mechanics (WCCM XIV)
8th European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS 2020)
July 19- 24, 2020, Paris, France

Models of thin-walled structures in biology and engineering
900 - STRUCTURAL MECHANICS, DYNAMICS AND ENGINEERING

SVETLANA M. BAUER, SERGEI B. FILIPPOV AND ANDREI L. SMIRNOV*

St. Petersburg State University
7/9 Universitetskaya nab., 199034, St. Petersburg, Russia
a_l_smirnov@mail.ru

Key words: thin-walled structures, non-classical theories of plates and shells, plates and shells in biomechanics, asymptotic methods

ABSTRACT

The mini-Symposium is open for an exchange of opinions about current developments, advantages, shortcomings, and prospects associated with applications of shell, membrane and plate structures in engineering and biomechanics (in ocular biomechanics, laryngology, otology etc.). This MS invites contributions from researchers on analysis, modeling and experiments of thin-walled structures. The session will focus on, but is not limited to, the following topics:

- Classical and non-classical shell, plate and beam models and their applications
- Strength, vibration and stability problems in thin beams, plates and shells
- Anisotropic thin-walled structures
- Biomechanical applications of shells, membranes and plates
- The asymptotic methods in the shell and plate theory
- Laminated sandwich structures
- FEM calculations in shell analysis
- Vibration and stability of elastic rods
- Deformations and buckling of nanoplates.

REFERENCES

[1] Bauer S.M., Filippov S.B., Smirnov A.L., Tovstik P.E., Vaillancourt R., Asymptotic methods in mechanics of solids. Birkhäuser, 2015, 325 p.
[2] Tovstik P.E., Smirnov A.L., Asymptotic methods in the buckling theory of elastic shells. World Scientific Publishing Co Ltd., Singapore, New Jersey, London, Hong Kong, 2001, 347 p.
[3] Bauer S.M., Voronkova, E.B., Nonclassical Shell Theories in Ocular Biomechanics, Advanced Structured Materials, vol. 45, Springer, 2015.
[4] Filippov S.B., Asymptotic and numerical analysis of free low-frequency ring-stiffened shells vibrations, Procedia Engineering, vol. 199, 2017, pp. 342-347.
[5] Bauer S.M., Kashtanova S.V., Morozov N.F., Semenov B.N., The Stability of the Plates with Circular Inclusions under Tension Generalized Models and Non-classical Approaches in Complex Materials, Advanced Structured Materials, vol. 89, Springer, 2018, pp.61-68

*Corresponding organizer