



Dear Colleagues!

Institute of Mathematics of the University of Georgia is pleased to invite you to the Online Tbilisi Analysis & PDE Seminar. The seminar is held bi-weekly on Mondays (at 16 : 00 GMT at 17 : 00 CET, at 20 : 00 local time in Tbilisi).

Talk on December 06

Speaker: Sergey MIKHAILOV, Professor of Computational and Applied Mathematics, Dept. of Mathematical Sciences, Brunel University London, UK
<http://people.brunel.ac.uk/~mastssm/>

The title of the lecture: **Volume and Layer Potentials for the Stokes System with Non-smooth Anisotropic Viscosity Tensor and Some Applications**

Abstract: The volume and layer potential theory in weighted Sobolev spaces on Lipschitz bounded and exterior domains is developed for the anisotropic Stokes system with essentially bounded discontinuous viscosity coefficient tensor satisfying a relaxed ellipticity condition for symmetric matrices. To this end, we explore equivalent mixed variational formulations and prove the well-posedness of some transmission problems for the anisotropic Stokes system in Lipschitz domains in weighted Sobolev spaces. These results are used to define the Newtonian and layer potentials and to obtain their properties. Then we analyse well-posedness of the exterior Dirichlet, Neumann and mixed problems for the Stokes system with discontinuous elliptic coefficient tensor satisfying a relaxed ellipticity condition.

Finally, we prove the existence of a solution for a transmission problem in complementary Lipschitz domains in 3D for the anisotropic Navier-Stokes system. The analysis relies on an existence result for a Dirichlet-transmission problem for the anisotropic Navier-Stokes system in a family of bounded domains, and on the Leray-Schauder fixed point theorem.

Presentation is based on the results obtained in collaboration with M. Kohr (Cluj-Napoca, Romania) and W.L.Wendland (Stuttgart, Germany): M. Kohr, S.E. Mikhailov, W.L. Wendland, Layer potential theory for the anisotropic Stokes system with variable L_∞ symmetrically elliptic tensor coefficient. *Math. Meth. Appl. Sci.*, **44** (2021), 9641–9674.

Date: December 06, 2021

Time: 16 : 00 GMT (17 : 00 CET and 20 : 00 local time in Tbilisi)

How to join:

The seminar is organized on the **Cisco Webex Meetings**. If you are already registered, you do not need to register again. Otherwise, to join the seminar please send an e-mail to seminarim@ug.edu.ge or register here:

<https://forms.gle/xfQJ9fg1uqe7CrZw6>

You will then receive further information.

WEB of Seminar: <https://www.ug.edu.ge/en/tbilisi-analysis-and-pde-seminars>

Organizers:

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2. E. Shargorodsky, Department of Mathematics, King's College London
3. G. Tephnadze, Institute of Mathematics, University of Georgia, Tbilisi

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