

Tbilisi Analysis & PDE Seminar



Credit: <http://www.personal.reading.ac.uk/~sms03snc/Simon%20Chandler-Wilde%20photo.jpg>

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 May 24:

Speaker: Prof. Simon Chandler-Wilde, University of Reading, UK; <http://www.personal.reading.ac.uk/~sms03snc/>

The title of the lecture: “Do Galerkin methods converge for the classical 2nd kind boundary integral equations in polyhedra and Lipschitz domains?”

Abstract: The boundary integral equation method is a popular method for solving elliptic PDEs with constant coefficients, and systems of such PDEs, in bounded and unbounded domains. An attraction of the method is that it reduces solution of the PDE in the domain to solution of a boundary integral equation on the boundary of the domain, reducing the dimensionality of the problem. Second kind integral equations, featuring the double-layer potential operator, have a long history in analysis and numerical analysis. They provided, through C. Neumann, the first existence proof to the Laplace Dirichlet problem in 3D, have been an important analysis tool for PDEs through the 20th century, and are popular computationally because of their excellent conditioning and convergence properties for large classes of domains. A standard numerical method, in particular for boundary integral equations, is the Galerkin method, and the standard convergence analysis starts with a proof that the relevant operator is coercive, or a compact perturbation of a coercive operator, in the relevant function space. A long-standing open problem is whether this property holds for classical second kind boundary integral equations on general non-smooth domains. In this talk we give an overview of the various concepts and methods involved, reformulating the problem as a question about numerical ranges. We solve this open problem through counterexamples, presenting examples of 2D Lipschitz domains and 3D Lipschitz polyhedra for which coercivity does not hold. This is joint work with Prof Euan Spence, Bath.

Date: May 24, 2021;

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

How to join:

The seminar is organized on the platform of WEBEX. To join the seminar, please send an e-mail to seminarim@ug.edu.ge or fill in the registration form here <https://forms.gle/xfQJ9fg1uqe7CrZw6>. You will then receive further information.

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

Organizers:

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

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