

Dear Colleagues!

The V. Kupradze Institute of Mathematics at the University of Georgia is pleased to invite you to the Online Tbilisi Analysis & PDE Seminar. The seminar is held bi-weekly on Wednesdays at 18:30 (GMT+4) local time in Tbilisi.

Talk on June 17, 2026

Speaker: Dr. Karel Van Bockstal, Ghent University, Belgium;

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<https://cage.ugent.be/kvb/>

The title of the lecture: “An Explicit and Stable Approximation of the Impulse Response for Fractionally Damped Oscillators”

Abstract: Fractional damping models have attracted considerable attention due to their ability to capture complex dissipative phenomena that cannot be adequately described by classical viscous damping. In this talk, we consider a fractionally damped oscillator in which the damping term is represented by a Caputo fractional derivative of order $\beta \in (0, 1)$. The corresponding impulse response can be expressed in terms of a bivariate Mittag-Leffler function involving a double infinite series. While this representation is mathematically exact, its numerical evaluation may become computationally unstable and difficult to use in engineering applications.

To overcome these challenges, we derive an explicit approximation of the impulse response that avoids the numerical instabilities associated with the original series representation while preserving excellent accuracy. The resulting expression may be viewed as a fractional counterpart of the classical impulse response of a viscously damped oscillator. Extensive comparisons in both the time and frequency domains demonstrate the accuracy, robustness, and computational efficiency of the proposed approximation. Finally, its practical applicability is illustrated through the computation of system responses to arbitrary excitations via the Duhamel integral and through validation against experimental data.

Date: June 17, 2026

Time: 18:30 (GMT+4) local time in Tbilisi;

(Compare to your local time: <https://www.timeanddate.com/worldclock/georgia/tbilisi>);

How to join:

The seminar is organized on the [Google Meet](#) platform. If you are already registered, you do not need to register again. Otherwise, to join the seminar, please send an email to kim@ug.edu.ge or register here:

<https://forms.gle/xfQJ9fg1uqe7CrZw6>.

You will then receive further information.

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

Organizers:

1. R. Duduchava, Institute of Mathematics, University of Georgia, Tbilisi, Georgia
2. E. Shargorodsky, Department of Mathematics, King's College London, UK
3. A. Meskhi, Kutaisi International University, Kutaisi, Georgia

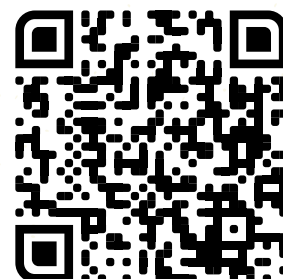
Secretary:

M. Tsaava, Institute of Mathematics, University of Georgia, Tbilisi, Georgia

Technical support:

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Google Meet Join Information

- **Video Call Link:** <https://meet.google.com/wux-wcat-jyu>
- **Invitation (Calendar) Link:**
<https://calendar.app.google/7GxkYetKVZVAEpsc8https://calendar.app.google/82cQ5akv7WASMME5A>