

# INTERNATIONAL BIWEEKLY ONLINE SEMINAR ON ANALYSIS, DIFFERENTIAL EQUATIONS AND MATHEMATICAL PHYSICS

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Coordinators: Prof. Alexey Karapetyants, Prof. Vladislav Kravchenko

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**14 November 2024, 6 pm (UTC+3)**

## The generalized eigenvalue problem for the classical Euler differential equation and Meijer's $G$ -function

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We present a fundamental system of solutions of the generalized eigenvalue problem for the classical higher order Euler differential equation. In the course of deriving the solution, we review some of the basics of generalized hypergeometric functions and Meijer's  $G$ -functions and some of its special cases where the underlying Mellin-type integrand exhibits higher-order poles. We will also touch upon certain nonhomogeneous higher-order Euler differential equations

Our work on the generalized eigenvalue problem for the Euler differential equation was motivated by our recent study of the essential self-adjointness in  $L^2(\mathbb{R}^n; d^n x)$ ,  $n \in \mathbb{N}$ , of the strongly singular homogeneous differential operator

$$\Delta^2 + c|x|^{-4}|_{C_0^\infty(\mathbb{R}^n \setminus \{0\})}, \quad c \in \mathbb{R}$$

which, upon angular momentum decomposition, leads to special cases of generalized eigenvalue problems for 4-th order Euler differential equations.

This talk is based on joint work with Markus Hunziker (Baylor Univ., TX, USA) and Gerald Teschl (Univ. of Vienna, Austria) and it will be accessible to a large audience.

\*Seminar website: <https://msrn.sfedu.ru/sl>. The seminar uses Microsoft Teams online platform.

Please send questions to [ademp.seminar@gmail.com](mailto:ademp.seminar@gmail.com) (Tatiana Andreeva, scientific secretary).

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The seminar is organized by the coordinators Alexey Karapetyants and Vladislav Kravchenko within the activities of the Regional Mathematical Center of the Southern Federal University in collaboration with Institute of Mathematics, Mechanics and Computer Sciences of the Southern Federal University and the OTHA research group in Operator Theory and Harmonic Analysis.



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