

Bahçeşehir University, Istanbul, Turkey
Analysis & PDE Center, Ghent University, Ghent, Belgium
Institute Mathematics & Math. Modeling, Almaty, Kazakhstan

“Analysis and Applied Mathematics”

Weekly Online Seminar

Seminar leaders:

Prof. Allaberen Ashyralyev (BAU, Istanbul),
Prof. Michael Ruzhansky (UGent, Ghent),
Prof. Makhmud Sadybekov (IMMM, Almaty)

Date: **Tuesday, May 24, 2022**

Time: 14.00-15.00 (Istanbul) = 13.00-14.00 (Ghent) = 17.00-18.00 (Almaty)

Zoom link: <https://us02web.zoom.us/j/6678270445?pwd=SFNmQUlVTD0tRaH-IDaVYrN3I5bzJVQT09>, **Conference ID:** 667 827 0445, **Access code:** 1

Speaker:

Assoc. Prof. Dr. Maksim V. Kukushkin

Moscow State University of Civil Engineering, Moscow, Russia

Kabardino-Balkarian Scientific Center, Russian Academy of Sciences, Russia

Title: **Natural lacunae method and Schatten-von Neumann classes of the convergence exponent**

Abstract: The first our aim is to clarify the results [1] obtained by Lidsky V.B. devoted to the decomposition on the root vector system of the non-selfadjoint operator. We use a technique of the entire function theory and introduce a so-called Schatten-von Neumann class of the convergence exponent. Considering strictly accretive operators satisfying special conditions formulated in terms of the norm, we construct a sequence of contours of the power type in the contrary to the results of Lidsky V.B., where a sequence of contours of the exponential type was used. As an application, we study the Cauchy problems for the evolution equation in the abstract Hilbert space [2]. The made approach allows us to obtain a solution analytically for the right-hand side belonging to a sufficiently wide class of operators. In this regard such operators as the Riemann-Liouville fractional differential operator, the Riesz potential, the difference operator have been involved. Moreover, we produce the artificially constructed normal operator for which the clarification of the Lidsky results relevantly works.

References:

[1] Lidskii V.B. *Summability of series in terms of the principal vectors of non-selfadjoint operators. Tr. Mosk. Mat. Obs.*, **11** (1962), 3-35.

[2] Kukushkin M.V. *Evolution Equations in Hilbert Spaces via the Lacunae Method. arXiv, arXiv:2202.07338 [math.FA], <https://doi.org/10.48550/arXiv.2202.07338>.*

Biography:

Maksim V. Kukushkin has obtained a degree in Mathematics in 2002 and PhD degree in Mathematics in 2016, last of them from Ministry of Education and Science of Russian Federation (Russia). After completion of his studies, he had a position of Associate Professor in Saint-Petersburg State University of Aerospace Instrumentation, Emperor Alexander I Saint Petersburg State Transport University, Kabardino-Balkarian Scientific Center, RAS, Moscow State University of Civil Engineering. His topics of research deal mostly with the spectral theory of non-selfadjoint operators, the applications to the semigroup theory, as well as to evolution equations in the abstract Hilbert space.