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JOIN THE SEMINAR

6 March 2025, 6 pm (UTC+3)

Direct and Inverse Spherically Symmetric Transmission Eigenvalue Problems: Past, Present, and Future

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Research on transmission eigenvalues has been a highly active area in inverse scattering theory. In this talk, we examine the interior transmission eigenvalue problem (TEP) in the context of a spherically symmetric refractive index. We present a literature review of key findings on both the direct and inverse TEP, from the late 1980s to the present [1]. This includes various theorems concerning the existence and distribution of real and complex eigenvalues, as well as uniqueness theorems for the inverse problem. As we progress, we will arrive at some open and intriguing questions related to the spherically symmetric TEP. Finally, we conclude with a novel numerical approach to solving the TEP, utilizing the Neumann Series of Bessel Functions (NSBF) representation [2].

1. N. Pallikarakis, A review on the direct and inverse transmission eigenvalue problem for the spherically symmetric refractive index, Bol. Soc. Mat. Mex., 30(92), 2024. https://doi.org/10.1007/s40590-024-00661-0.
2. V. V. Kravchenko, L. E. Murcia-Lozano and N. Pallikarakis, Neumann series of Bessel functions in direct and inverse spherically symmetric transmission eigenvalue problems, (working paper).

*Seminar website: https://msrn.sfedu.ru/sl. The seminar uses Microsoft Teams online platform.
Please send questions to ademp.seminar@gmail.com (Tatiana Andreeva, scientific secretary).

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