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3 September 2026, 6 pm (UTC+3)

Functional equations and symmetry in the problem of wave scattering on a regular polygon with third-kind boundary conditions

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Using the example of the problem of wave scattering by a regular polygon, an approach to studying wave diffraction in polygonal regions on a plane is presented. In the case under consideration, the approach also exploits the symmetry of the scatterer, which makes it possible to reduce the solution of the problem to a problem on a symmetry cell of the region. By further reducing the problem on the cell within the framework of a modification of the Sommerfeld–Malyuzhinets method, a system of functional equations on the complex plane of a complex variable is obtained and studied; this system is equivalent to the problem on the cell.

The Fredholm property of the system has been proven, utilizing its connection with integral equations. An expression for the scattering diagram has been obtained in terms of the solution to the system of functional equations.

*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).

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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