

Spectral decompositions related to the polyharmonic operators

Anvarjon Ahmedov^{a,b}, Abdizhahan Sarsenbi^{c,d,e}

*^aDepartment of Process and Food Engineering, Faculty of Engineering
Universiti Putra Malaysia, Malaysia*

*^cM. Auezov South Kazakhstan State University, Scientific Center of Theoretical
and Applied Mathematics, Kazakhstan*

*^dInstitute of Mathematics and Mathematical Modeling Science Committee of the
Ministry of Education and Science of the Republic of Kazakhstan, Kazakhstan*

^banvarjon@upm.edu.my, ^eabzhahan@mail.ru

Abstract: In this work, we study the localization problems of the differential operators in closed domain. Riesz means of the eigenfunction expansions are investigated. The properties of the functions from Nikolskii classes are used.

Keywords: polyharmonic operator, spectral expansions, eigenvalues, eigenfunctions, convergence.

References:

- [1] Sh.A. Alimov, The summability of the Fourier series of functions in L_p in terms of eigenfunctions, *Differentsial'nye Uravnenija*, vol. 6, pp. 567-576, 1970.
- [2] L. Garding, Eigenfunction expansions connected with elliptic differential operators, *Twelfth Scandinavian Congress of Mathematicians (Lund)*, pp. 44-45, 1953.
- [3] V.A. Il'in, The convergence of expansions by eigenfunctions of the Laplace operator, *Uspekhi Matematicheskikh Nauk*, vol. 13, no. 1, pp. 87-100, 1958.
- [4] V.A. Il'in, Localization and convergence problems for Fourier series by fundamental function systems of the Laplace operator, *Uspekhi Matematicheskikh Nauk*, vol. 23, no. 2, pp. 61-120, 1968.
- [5] V.A. Il'in, Sh.A. Alimov, Conditions for the convergence of spectral decompositions that correspond to self-adjoint extensions of elliptic operators. I, II", *Differentsial'nye Uravneniya*, vol. 7, pp. 670-710, 1971.
- [6] S. Kaczmarz, H. Steinhaus, *Theorie der Orthogonalreihen*, Chelsea, New York, 1951.
- [7] B.M. Levitan, On expansion by eigenfunctions of the Laplace operator, *Doklady Akademii Nauk SSSR*, vol. 90, pp. 133-135, 1953.
- [8] E.C. Titchmarsh, *Eigenfunction Expansions Associated with Second Order Differential Equations. II*, Clarendon Press, Oxford, 1958.
- [9] L. Hormander, On the Riesz means of spectral functions and eigenfunction expansions for elliptic differential operators, *Recent advances in the Basic Sciences, Proc. Annual Sci. Conf. Belfer Grad. School Sci. 2*, Yeshiva Univ. New York, 1965-1966.