

Limit Operators and Their Applications to Mathematical Physics

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The talk is devoted to applications of the limit operators method (see [1]) to some problems of Mathematical Physics. We will consider:

- The essential spectra some discrete models of Mathematical Physics (see [2],[3]);
- The essential spectra and exponential estimates at infinity of eigenfunctions of general differential and pseudodifferential operators on \mathbb{R}^n , in particular, Schrödinger and Dirac operators with general potentials (see [4], [5]);
- Fredholm properties of pseudodifferential operators on some non compact surfaces in \mathbb{R}^n with applications to the scattering problems on unbounded obstacles (see [6]).

References

- [1] V. Rabinovich, S. Roch, B. Silbermann, Limit Operators and Their Applications in Operator Theory, Operator Theory: Advances and Applications, vol.150, Burkhauser, 2004, Basel Boston Berlin.
- [2] V. Rabinovich, S. Roch, Essential spectra and exponential estimates of eigenfunctions of lattice operators of quantum mechanics, *J. Phys. A: Math. Theor.* 42 (2009) 385207 (21pp)
- [3] V. Rabinovich, S. Roch, Essential spectra of difference operators on \mathbb{Z}^n -periodic graphs, *J. Phys. A: Math. Theor.* 40 (2007) 10109–10128
- [4] V. Rabinovich, Essential Spectrum of Perturbed Pseudodifferential Operators. Applications to the Schrödinger, Klein–Gordon, and Dirac Operators, *Russian Journal of Mathematical Physics*, Vol. 12, No. 1, 2005, pp. 62–80.
- [5] V. Rabinovich, S. Roch, Essential Spectrum and Exponential Decay Estimates of Solutions of Elliptic Systems of Partial Differential Equations. Applications to Schrödinger and Dirac Operators, *Georgian Mathematical Journal*. Volume 15, Issue 2, Pages 333–351, ISSN (Online) 1072-9176.
- [6] V. Rabinovich, The Fredholm Property and Essential Spectra of Pseudodifferential Operators on Non-compact Manifolds and Limit Operators, *Contemporary Mathematics*, AMS, 2015.