Abstract

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"Schrödinger operators with n positive eigenvalues:
an explicit construction of complex-valued potentials
of von Neumann-Wigner type"

I begin with a brief review of the research history on von Neumann-Wigner type potentials. The studies for the Schrödinger operators of this type have been made mainly for the real-valued potentials which give rise one embedded eigenvalue in the continuum of the spectra.

In this talk, we propose a simple and explicit construction for embedding n positive eigenvalues in the spectrum of a Schrödinger operator on the half-line with a Dirichlet boundary condition at the origin. The resulting potential V is of von Neumann-Wigner type, but can be real- as well as complex-valued. The obtained result leads to a similar result for the Schrödinger operator on $\mathbb{R}^3$ with the spherically symmetric potential $V(|\cdot|)$.

This talk is based on joint work with Serge Richard (University of Nagoya) and Jun Uchiyama (Kyoto Institute of Technology).

References

[1] S. Richard, J. Uchiyama and T. Umeda: *Schrödinger operators with n positive eigenvalues: an explicit construction involving complex-valued potentials*, Proc. Japan Acad. **92**, Ser.A (2016), 7–12.

[2] J. Uchiyama: *Simple construction of the Schrödinger operator having many positive eigenvalues*, Proceedings of the Fourth Workshop on Differential Equations, Chonnam National University, Kwangju, KOREA (1999), 197–199.