

## ON EXTENSIONS OF SYMMETRIC OPERATORS

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*Abstract.* We give an explicit description of all minimal self-adjoint extensions of a densely defined, closed symmetric operator in a Hilbert space with deficiency indices  $(1, 1)$ .

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### REFERENCES

- [1] C. BARTELS, S. CURRIE, M. NOWACZYK, AND B. A. WATSON, *Sturm–Liouville problems with transfer condition Herglotz dependent on the eigenparameter: Hilbert space formulation*, Integral Equations Operator Theory **90** (2018), no. 3, Art. 34, 20 pp.  
<https://arxiv.org/abs/1804.07149>.
- [2] J. BEHRNDT AND F. PHILIPP, *Finite rank perturbations in Pontryagin spaces and a Sturm–Liouville problem with  $\lambda$ -rational boundary conditions*, Indefinite inner product spaces, Schur analysis, and differential equations, Birkhäuser/Springer, Cham, 2018, pp. 163–189.
- [3] V. M. BRUK, *A certain class of boundary value problems with a spectral parameter in the boundary condition* (Russian), Mat. Sb. (N.S.) **100(142)** (1976), no. 2, 210–216.
- [4] V. DERKACH, *Boundary triplets, Weyl functions, and the Krein formula*, Operator theory, Springer, Basel, 2015, pp. 183–218.
- [5] B. FRIEDMAN, *Principles and techniques of applied mathematics*, John Wiley & Sons, Inc., New York, 1956.
- [6] C. T. FULTON, *Two-point boundary value problems with eigenvalue parameter contained in the boundary conditions*, Proc. Roy. Soc. Edinburgh Sect. A **77** (1977), no. 3–4, 293–308.
- [7] F. GESZTESY AND E. TSEKANOVSKII, *On matrix-valued Herglotz functions*, Math. Nachr. **218** (2000), 61–138, <https://arxiv.org/abs/funct-an/9712004>.
- [8] N. J. GULIYEV, *Essentially isospectral transformations and their applications*, Ann. Mat. Pura Appl. (4), to appear, <https://arxiv.org/abs/1708.07497>.
- [9] M. G. KREIN, *On Hermitian operators with deficiency indices one* (Russian), Dokl. Akad. Nauk SSSR **43** (1944), 339–342.
- [10] M. A. NAIMARK, *Spectral functions of a symmetric operator* (Russian), Izv. Akad. Nauk SSSR. Ser. Mat. **4** (1940), no. 3, 277–318.
- [11] M. A. NAIMARK, *On spectral functions of a symmetric operator* (Russian), Izv. Akad. Nauk SSSR. Ser. Mat. **7** (1943), no. 6, 285–296.
- [12] K. SCHMÜDGEN, *Unbounded self-adjoint operators on Hilbert space*, Springer, Dordrecht, 2012.
- [13] A. V. SHTRAUS, *On spectral functions of differential operators* (Russian), Izv. Akad. Nauk SSSR. Ser. Mat. **19** (1955), no. 4, 201–220.