

# Positiveness of second order differential operators with interior singularity

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**Abstract:** The main goal of this study is to provide an operator-theoretic framework for the investigation of discontinuous Sturm-Liouville problems with eigenparameter appearing in the boundary conditions. We introduce some self-adjoint compact operators in suitable Sobolev spaces such a way that the considered problem can be reduced to an operator-pencil equation. We define a new concept so-called generalized eigenfunctions and prove positiveness of operator-pencil corresponding to the considered problem.

**Keywords:** Sturm-Liouville problem, operator-pencil, interior singularity

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