

On self-adjoint boundary conditions for singular Sturm–Liouville operators

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Abstract. The classical boundary values for regular Sturm–Liouville operators associated with a three-coefficient differential expression on a compact interval $[a, b]$, is extended in a natural manner to the case where the differential expression is singular on an arbitrary open interval (a, b) of the real line under the assumption that the associated minimal operator is bounded from below. The notion of (non)principal solutions of the associated differential equation plays a key role in this analysis.

We briefly discuss the singular Weyl–Titchmarsh–Kodaira m -function and illustrate the theory with the special case of Bessel and Legendre operators.

This is based on joint work with Lance Littlejohn and R. Nichols.

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