ACCUMULATION OF COMPLEX EIGENVALUES OF AN INDEFINITE STURM—LIOUVILLE OPERATOR WITH A SHIFTED COULOMB POTENTIAL

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Abstract. For a particular family of long-range potentials $V$, we prove that the eigenvalues of the indefinite Sturm–Liouville operator $A = \text{sign}(x)(-\Delta + V(x))$ accumulate to zero asymptotically along specific curves in the complex plane. Additionally, we relate the asymptotics of complex eigenvalues to the two-term asymptotics of the eigenvalues of associated self-adjoint operators.


Keywords and phrases: Linear operator pencils, non-self-adjoint operators, Sturm–Liouville problem, Coulomb potential, complex eigenvalues, Kummer functions.

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