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## Algebraic methods for matrix quantum mechanics with orthogonal polynomials

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Poster Abstract:

When using matrix methods in quantum mechanics it is common to use orthogonal polynomials as an expansion basis. The eigenvalues and eigenvectors of such provide the energies and wavefunctions for bound states in the Schrodinger equation, and when considering a complex scaling method we can extract the lifetimes of resonance states. Investigating the properties of orthogonal polynomials can provide insights into more computationally efficient methods for constructing the necessary matrices. We present results on the application of these methods to a number of simple test cases of  $1D$  problems where we can compare to standard theory.

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