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Title: The spectral problem in Hilbert spaces of analytic functions

Abstract:
In the space $L^2(\mathbb{R})$ the spectral problem of Hamilton operators with one degree of freedom takes the form of a lateral connection problem for diverging (asymptotic) solutions which is believed to require the construction of the full solution for all x. It will be demonstrated that the problem may be circumvented by employing Hilbert spaces of analytic functions. The linear and non-linear quantum Rabi models serve as examples where the generalized spectral determinant can be constructed via absolutely convergent series expansions. Furthermore, it is outlined how to apply the technique to the anharmonic oscillator with quartic coupling.