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Approximating the Jost function using artificial neural networks

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The theory of the Jost function provides an elegant and unified framework for determining resonance and bound states. These states are determined by 1)Solving a system of differential equations, which are equivalent to the Schrödinger equation, to obtain the Jost functions.
2)Searching for the zeros of the Jost function in the complex energy plane.

This approach has been successfully employed to determine these states with high accuracy using classical numerical methods techniques such as the Runge-Kutta-Fehlberg (RK45) method and the Newton-Raphson method. In this presentation, I will provide a brief introduction to the theory of Jost functions and discuss the potential of using Physics-Informed Neural Networks (PINNs) as an alternative approach for determining both the Jost function and the associated states

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