Title:	Characterization of Resonances for 1-D Potentials through Uncertainty Measures
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Abstract:	Resonances and bound states are quantum phenomena without classical analogues. They share a commonality in that they can both be obtained from the poles of the S-matrix. The probabilistic nature of the quantum world is best understood in terms of uncertainty relations like Heisenberg's celebrated principle. However, standard deviation fails to adequately capture localization for multi-modal distributions, while Shannon information entropy is lucrative due to its sole dependence on the distribution. By simulating model 1-D quantum systems, an effort can be made to classify bound states and characterize resonances in terms of both these uncertainties in the position and momentum conjugate spaces. These measures are evaluated for the stationary wavefunctions of the finite square well and the finite rectangular barrier to study the bound states of the former and the resonances of the latter. They are also computed for a Gaussian wavelet propagating through the finite rectangular barrier as well as the symmetric double barrier with the goal of characterizing the resonant energies.
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