Solving Schrodinger Equation in Mixed Representation
MALLIKA DHAR, CHARLES WERNETH, The University of Southern Mississippi, CHRISTOPHER SIROLA, KHIN MAUNG, The University of Southern Mississippi, USM COLLABORATION — Solving the Schrodinger equation with relativistic kinematics is easier in momentum space since the momentum operators under the radical sign simply become numbers. But power law potentials become singular in momentum space and subtraction procedures become necessary. By using the coordinate representation for the potential part and momentum representation for the kinetic energy part, one can solve these problems, but the resulting equation has an oscillating integral with a spherical Bessel function. We expand the wave function in a complete set of basis functions which has an exact Fourier transform and study the convergence of the solution by using different integration methods.

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