Eigensolutions of the Schr¨odinger Equation with Some Physical Potentials

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Abstract: Using the parametric Nikiforov-Uvarov methodology, we have obtained the analytical approximation to the `-wave solutions of the Schr¨odinger equation with a combination of the modified Hylleraas potential and the Yukawa potential and with a combination of the modified Hylleraas potential and the Coulomb potential. The energy eigenvalue equations and their corresponding wave functions have been obtained explicitly. To show the accuracy of our results, we have calculated the eigenvalues numerically for arbitrary quantum numbers n and `