Shannon Entropy and Fisher Information for Screened Kratzer Potential

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Abstract

In this paper, the Shannon entropy and Fisher information are studied for the screened Kratzer potential model (SKP). We calculated the position and momentum entropies for the screened Kratzer potential for its ground states as well as the first excited state. Our result shows that the sum of the position and momentum entropies satisfies the lower bound Berkner, Bialynicki–Birula and Mycieslki (BBM) inequality. Also, our results showed that decreasing Shannon entropy in the position space was complemented with an increasing Shannon entropy in the momentum space. Similarly, we evaluated for Fisher information and show that the Stam, Cramer-Rao inequalities are satisfied. The squeezing phenomena were also observed for certain values of the screening parameter α.
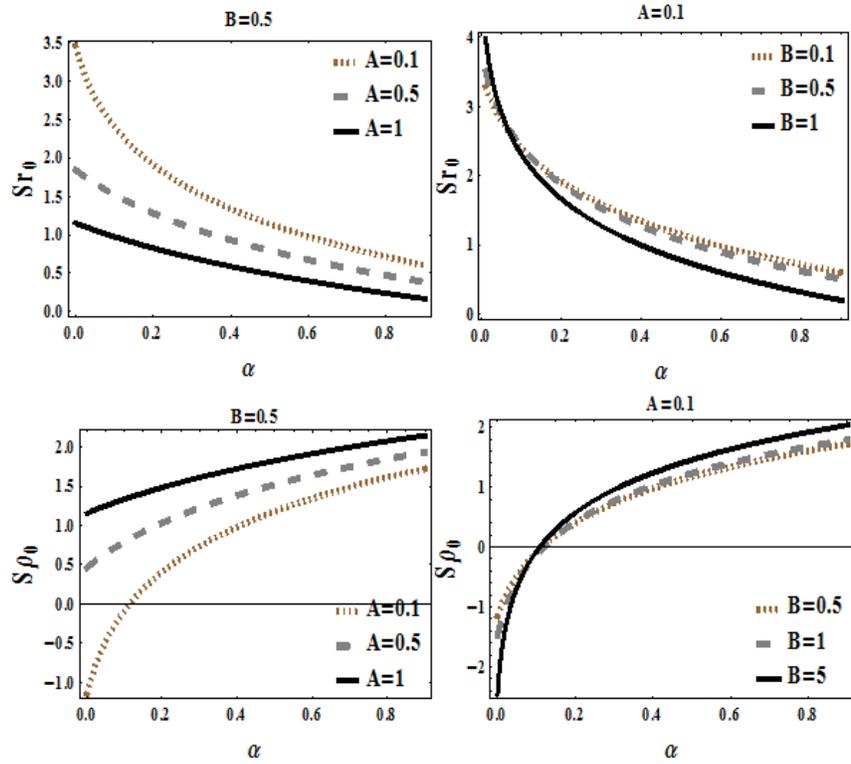
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