

Chem. 540
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Models – Problem 1

Consider a particle in a one-dimensional square well of length L with infinite walls at $x = 0$ and $x = L$.

- a) Calculate the probability $P(x; \lambda)$ of finding the particle between $x - \lambda/2$ and $x + \lambda/2$, where λ is a small but finite length. Consider values of x between $\lambda/2$ and $L - \lambda/2$ only.
- b) What is this probability for a classical particle?
- c) Show that as the quantum number n becomes large, the quantum mechanical probability approaches the classical result.