

QUANTUM MECHANICS H.W №2

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PROBLEM (1)

Using the uncertainty principle for position and momentum, estimate the ground state energy for an infinite well of width a , compare the obtained result with the one found in the lecture.

PROBLEM(2)

Compute $\langle E \rangle$, $\langle p \rangle$ and $\langle x \rangle$ for the particle in a box.

PROBLEM (3)

Show that the normalisation factor for the particle in a box wavefunction is given by $\sqrt{\frac{2}{a}}$

PROBLEM(4)

Show that the eigenfunctions $u_n(x)$ are orthogonal .

PROBLEM (5)

What is the ground state, first excited and second excited states energies for an electron trapped in an infinite well of width 1 \AA .