

1 Dimensional Analysis of Kets

- (a) $\langle \Psi | \Psi \rangle = 1$ Identify and discuss the dimensions of $|\Psi\rangle$.
- (b) For a spin- $\frac{1}{2}$ system, $\langle \Psi | + \rangle \langle + | \Psi \rangle + \langle \Psi | - \rangle \langle - | \Psi \rangle = 1$. Identify and discuss the dimensions of $|+\rangle$ and $|-\rangle$.
- (c) In the position basis $\int \langle \Psi | x \rangle \langle x | \Psi \rangle dx = 1$. Identify and discuss the dimensions of $|x\rangle$.

2 ISW Right Quarter

A particle is confined in a one-dimensional infinite square well on $0 < x < L$. For each of the first three energy eigenstates (i.e., $n = 1, 2, 3$), calculate the probability that a position measurement yields a result in the region $\frac{3L}{4} < x < L$.