FURTHER QUANTUM MECHANICS

Review of QM Concepts

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Lecture 1: Proof of Concept

Quantum Mechanics is based on three new concepts, none of which have simple correlates in classical physics:

- The state, or ket $|\psi\rangle$;
- The probability amplitude, or amplitude $\langle\phi|\psi\rangle$;
- The operator $\hat{A}$;

Combining the last two we obtain the final concept which derives from these:

- The matrix element $\langle\phi|\hat{A}|\psi\rangle$.

The ket $|\psi\rangle$.

The ket is the complete quantum state of the system, from which we can diagnose all its properties at a given time.

By contrast: **the complete Classical State**

Here is an example of a boxed equation, using the 'cbox' environment.

$$\boxed{|\psi(t)\rangle = \sum_i c_i \exp(-iE_i t/\hbar)\,|E_i\rangle\,.}$$

'cbox' is a wrapper for the align* environment; so you may have line breaks:

$$\boxed{\begin{aligned}|\psi(t)\rangle &= \sum_i c_i \exp(-iE_i t/\hbar)\,|E_i\rangle\,.\\ |\phi(t)\rangle &= \sum_i c_i \exp(-iE_i t/\hbar)\,|E_i\rangle\,.\end{aligned}}$$

We may also use inline boxes with the 'lbox' command: see, for example this inline box: $\boxed{y = mx + c}$ as well as another one: $\boxed{y \neq mx + b}$

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