Heisenberg's Uncertainty Principle

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July 2021

About The Principle

Introduced by Werner Heisenberg in 1927, the uncertainty principle is a limit on quantum mechanics. It states that the more certain you are about a particle's momentum (P) the less certain you are about the particle's position (x) ie. momentum and position can never both be known exactly. A common misconception is that this effect is due to a problem with the measuring procedure. This is incorrect, it is a limit on accuracy fundamental to quantum mechanics. The right hand side involves Plank's constant (h) which is equal to a tiny value (a decimal with 33 zeros), which is why this effect isn't observed in our everyday, "classical", experience.

The Mathematical Equation

$$\Delta x \Delta \rho \quad \geq \quad \frac{\hbar}{2}$$