

5.2 TIME-ENERGY UNCERTAINTY RELATION

Heisenberg's uncertainty principle is applicable to all conjugate or complementary pairs of physical variables the product of which has the dimensions of Planck's constant i.e. action (energy \times time).

The most common of these pairs are; position-linear momentum, time-energy, and angular momentum-angular displacement.

The time energy uncertainty principle states:

In any simultaneous determination of the time and energy of a particle, the product of the uncertainties is equal to or greater than Planck's constant h .

Thus,

$$\Delta E \cdot \Delta t \geq h$$

where ΔE is the uncertainty in the measurement of energy and Δt the corresponding uncertainty in the measurement of time.

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1. Name : Dr. Vinay Singh
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