Path Integral Formulation of Quantum Mechanics

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There exists an alternative formulation of Quantum Mechanics without using *operators* or the *Schrodinger equation*. It is based on the following idea: In Classical mechanics, a particle moves from point A to B along a well defined path and, on this path, its position can be accurately specified at any time.

In quantum theory, one cannot specify the exact location of the particle as only the probability of finding it in some region of space can be given. As a result, the motion of a quantum particle from A to B cannot take place along a well defined path.

Let us imagine that the particle can move from A to B along any path (not necessarily the classical one) with a certain probability assigned to each path. Then, to describe the quantum motion from A to B, one has to take into account all possible paths with their respective probabilities.

This picture of quantum motion turns out to be very powerful and leads to an alternative formulation of quantum theory, called the *Path Integral formulation*.

The Path Integral formalism provides an intuitive and physical understanding of quantum mechanics. It is also an indespensible tool in more advanced applications of quantum theory. In this project we will learn about this alternative formulation of quantum mechanics.

More information : `<www.physto.se/~fawad/path-integral.html>`
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