Department of Physics and Physical Oceanography Physics 495 Research Project

"Three Pictures of Quantum Mechanics"

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Abstract

In making calculations in quantum mechanics, the state vector (or, wave function) of the system is of extreme importance. The wave function contains all the information of the quantum system, acted upon by quantum operators. For a system which changes in time there are several questions which needed to be answered early on in quantum mechanics: What is a wave function? What does it mean for the wave function of a system to change in time? Can operators change in time? Through the development of quantum mechanics there have arisen three primary "pictures" of how to make calculations for time-dependent systems, put forward by Schrödinger, Heisenberg, and Dirac. We will examine the questions raised previously and the answers given by these three pictures of quantum mechanics. Finally, we will do a calculation and see how one picture or another may be used to simplify (or greatly complicate) the process.

Friday, April 17, 2009
2:00 PM
DeLoach Hall, Room 212