

Hidden Parameter Theories in Quantum Mechanics

The historical development of hidden parameter theory, provided in the Einstein-Podolsky-Rosen¹ paradox indicates that quantum theory is not complete. This prompted attempts to formulate classes of so-called hidden parameter theories that can be subjected to experimental verifications in order to test the existence of a complete theory. Bell's² contribution to this generalization is investigated, as well as the responses to the Einstein-Podolsky-Rosen paradox by Bohr³ and others⁴. The meaning of hidden parameter theory and fundamental quantum mechanical theory is rigorously examined through a combination of the generalized theories in an overall attempt to define what classes of theories are acceptable.

¹ Einstein, A. Podolsky, B. and Rosen N "Can Quantum-Mechanical Description of Reality be Considered Complete?"

² Bell, J.S. "On the problem of hidden variables in quantum mechanics."

³ Bohr, N. "Can Quantum-Mechanical Description of Physical Reality be Considered Complete?"

⁴ Furry, W. H., Messiah, A., Bohm, D.