

Abstract:

The purpose of introducing this thesis is to review the difference between **Standard Quantum mechanics** and **Bohmian Quantum mechanics**. The aim of this dissertation is not only to contrast these theories with respect to formulation, but also to briefly review their historical, philosophical and sociological aspects.

This dissertation consists of two main sections. The first section is about reviewing the emergence profile of these theories and the formation of each theory along its historical path. In addition some beliefs about the founders of these theories and the impact of their beliefs on the evolution of their theories are put forward. As a complement to the above, the prevailing social conditions of the time of emergence of these theories have been studied.

In section two, first the formulation of each theory is briefly reviewed, and then their differences are examined. In the formulation section of the Bohmian mechanics two key concepts of **Quantum potential** and **empty waves** are defined. The examined significant differences between them are: **Uncertainty principle, Observation principle and Reduction of wave function, Nonlocality, Many-particles states, EPR and Bell's theorem**, and finally **the Classical limit**. At the end some implemented or suggested experiments for the contrast of the two theories are mentioned.