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Redefine Key Interpretive Problems in Heisenberg's Uncertainty Principle through Nagarjuna's Madhyamika Philosophical Lens

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Abstract

The research has three objectives: 1) to study the concept of Heisenberg's uncertainty principle, 2) to study the concept of truths and knowledge in Nagarjuna's Madhyamika philosophy and 3) to analyze the concept of Heisenberg's uncertainty principle through Nagarjuna's Madhyamika philosophical lens. This is documentary qualitative research. The uncertainty principle ($\Delta x \Delta p \geq \hbar/2$) represents valid scientific knowledge enabling quantum predictions and technology, functioning effectively as description of interdependent phenomena without requiring inherently existing particles or properties impossible to measure the position and momentum of a quantum particle at the same time. Quantum uncertainty reveals the emptiness (śūnyatā) of phenomena which impossibility of simultaneous precise measurement demonstrates not technical limitations but the absence of inherently existing properties, pointing to dependent origination (pratītyasamutpāda) at reality's foundation. In the study of Heisenberg's uncertainty principle through Nagarjuna's Madhyamika philosophical lens, research was found that the processes in acquiring certain knowledge of Heisenberg and Mahayana Buddhist philosophy are by one another in the sense that such knowledge is methodologically acquired through experience, rationality, and intuition because both see the truths/reality in the same manners, that is, the physical reality is viewed by Heisenberg as the thing that goes under changing state of wave-particle all the times, and the matter is seen by Nagarjuna's Madhyamika of Buddhist doctrine consists of two truths (satyadvaya) represents perhaps the most sophisticated solution to the perennial philosophical problem of reconciling appearance with reality, practical knowledge with ultimate understanding. The uncertainty principle transforms quantum mechanics into experimental demonstration of Mahayana Buddhist philosophy conventionally valid for scientific progress while ultimately revealing the interdependent, empty nature of all phenomena. Quantum indeterminacy becomes not a constraint on knowledge but wisdom recognizing that reality's ultimate groundlessness enables the rich conventional world of scientific discovery, technological mastery, and conscious experience.

Key words: Heisenberg’s Uncertainty Principle, Nagarjuna's Madhyamika philosophy, Two Truths, Dependent Origination, Conciousness