Rebuttal of Heisenberg's Uncertainty Principle: Replacing Uncertainty with Absolute Certainty

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Discussion

Heisenberg's Uncertainty Principle (HUP) is a cornerstone of quantum theory that is fundamental to contemporary theoretical physics. Introduced in 1927, it states that the position of a particle and its momentum cannot be determined simultaneously with a high degree of precision.[1]

Heisenberg developed his theory following a thought experiment concerning an imaginary observation of an electron in a γ-ray microscope.[2] He stated if the γ-ray is of sufficiently short wavelength, the position of the electron can be measured accurately. This interaction, however, transfers a large momentum to the electron, significantly disturbing its velocity/momentum. Therefore, another measurement with a longer wavelength γ-ray is needed to determine the velocity/momentum of the electron. This sets up a relationship between the precision of the measurement and the disturbance it creates, later termed the "measurement-disturbance relationship" (MDR).

In fact, the MDR issue is not unique to quantum states, but is common for macroscopic states of matter as well. One example: taking temperature readings when the mass of a thermometer and the mass of the test object are comparable. Here, the interaction of the temperature probe with the test article first leads to thermal equilibrium between them. In other words, the measurement disturbs the energy state of the object, so its temperature becomes "uncertain." During this step, the temperature of the test object decays by the exponential function:

$$\frac{dT}{dt} = -k(T - T_a)$$

However, if temperature measurements are taken at Δt time intervals over the period of cooling, a decay curve can be plotted which, if extrapolated to zero time (t_0), yields the exact initial temperature of the test object. This way, the uncertainty in the temperature measurement is resolved.

Similar logic can be applied to the HUP. An electron on its atomic orbital is disturbed by the short wavelength γ-photon, introducing an uncertainty in determining its velocity/momentum. However, if measurements are taken at Δt time intervals, the path/orbit of the electron is mapped out precisely and simultaneously, the distance over time $\Delta s/\Delta t$ yields the electron's velocity, all from the same measurement. This is similar to measuring the position and velocity of horses on a racetrack.

Here we make the observation that uncertainty in measuring various states of physical bodies (macro to "quantum") is nothing unusual, and merely dependent on experimental design. As there are no limits to the accuracy of length or time measurements, with proper design, uncertainty can be resolved and replaced with absolute certainty. In other words, uncertainty is illusionary—making the Universe fundamentally deterministic.

Strangely, this simple logic eluded Heisenberg when formulating his theory. Since its inception, HUP attracted criticism, including that of its most famous critic, Albert Einstein.[3,4] He presented thought experiments such as Einstein's slit and Einstein's box that in his view refuted Heisenberg's theory. Einstein instinctively recognized the logical inconsistency in HUP. In 1990, a treatise on quantum theory was presented by Simhony, who pointed out that all illogical postulates of quantum mechanics can be replaced by standard Newtonian physics.[5] Castellano also presented an insightful rebuttal of the basic tenets of quantum mechanics.[6]

Experimental proof also demonstrated the invalidity of HUP, even though its authors fell short of dismissing Heisenberg's theory entirely.[7] Quantum mechanics is so fundamental to theoretical physics that any revision seems unlikely in the short term.

It is unfortunate that some proponents of quantum theory continue to promote logical absurdity, and stress that the contradictions of quantum mechanics only prove the limitations of standard logic. However, the Copenhagen interpretation never considered that the principle of particle-wave duality, or superposition, are just due to a lack of understanding of the physics of the sub-elemental particle domain, which has been called aether or lattice space/space lattice.[5,8,9]

When a single electron forms an interference pattern over a double slit, it is due to the interaction of the electron with the surrounding aether, in much the same way as a similar double slit experiment, in which a "walking" droplet goes through one of the two slits[9] but its associated wave passes through both slits, producing the well-known interference pattern that creates the appearance of non-locality.

Quantum mechanics proposed that laws wildly different from the laws of the macro world govern the "quantum domain." However, Nature does utilize economical, modular design and scaling process in the construction of the Universe that challenges the idea of a special status for the subatomic world. We have presented some observations in

this regard by pointing out the observed universality of spiral structures in the physical world, and the significance of that spirality for the electron.[8]

The emerging theory of a fractal Universe proposes that "the Universe consists of a series of spiral bodies of diminishing size, each made in turn by plasma ejection and molded by a spatial Coriolis effect: a rotating fractal universe."[10,11] Fractals are the result of an iterative process wherein the repetition of a simple geometric form can reproduce an incredibly complex system. If we zoom into any section of the fractal we see the same pattern over and over, as seen when looking out into the cosmos. There is no room for quantum mechanics in the fractal universe that is most likely our Universe.

A salient feature of Nature is orderliness and consistency, with multilevel, interlocking hierarchies spanning all matter from the electron to supergalactic clusters. Its subsystems are tuned together perfectly and exhibit regular, repeating and predictable behavior, also called natural laws, that permit a scientific examination of the universe. There is an underlying logic in natural processes; even physics cannot exist without traditional logic. When a mathematical theory is presented as physics, it can lead to gross physical and philosophical misinterpretations that can spread to other disciplines which rely on quantum mechanics as scientific certainty.

In conclusion, we propose that the HUP should be replaced with an Absolute Certainty Principle (ACP), thereby restoring the logic and philosophical realism that are the hallmarks and fundamentals of science.

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References

1. Heisenberg, W. 1927. "Über den anschaulichen Inhalt der quantentheoretischen Kinematik und Mechanik," *Zeitschrift für Physik*, 43, 3-4, 172-198.
2. Heisenberg, W. 1930. *Physikalische Prinzipien der Quantentheorie*, Leipzig: Hirzel; English translation, *The Physical Principles of Quantum Theory*, University of Chicago Press.
3. Kumar, M. 2009. *Quantum: Einstein, Bohr and the Great Debate About the Nature of Reality*, Icon, p. 282.
4. Gamow, G. 1988. *The Great Physicists from Galileo to Einstein*, Courier Dover, p. 260.
5. Simhony, M. 1990. *The Electron-Positron Lattice Space: Cause of Relativity and Quantum Effects*. p. 29-38, Physics Section 5, The Hebrew University, Jerusalem, Israel.
6. http://www.arcaneknowledge.org/science/quantum.htm, accessed on 06/11/2016.
7. Rozema, L.A. *et al*. 2012. "Violation of Heisenberg's Measurement-Disturbance Relationship by Weak Measurements," https://arxiv.org/pdf/1208.0034.pdf
8. Grandics, P. 2007. "The Genesis of Fundamental Forces Acting at a Distance and Some Practical Derivations," *Infinite Energy*, 12, 71, 13-24.
9. https://hekla.ipgp.fr/IMG/pdf/Couder-Fort_PRL_2006.pdf, accessed on 06/14/2016.
10. http://www.fractaluniverse.org/v2/?page_id=2, accessed on 06/12/2016.
11. http://www.butterflyeffect.ca/Close/Pages/Fractals.html, accessed on 06/12/2016.

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