

Abstract Submitted
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The Electron as a Heisenberg Fluid - Linking Quantum Behavior with Relativity¹ SHANTIKUMAR NAIR², Amrita Centre for Nanosciences, Amrita Vishwa Vidyapeetham (University) — In this paper, the previous work by this author to address the quantum relativity connection is further extended. The electron here is modeled as a fluid obeying the Uncertainty Principle of Heisenberg. Such a Heisenberg fluid would exhibit the same electromagnetic coupling to the nucleus as predicted by electromagnetism; however, the fluid also satisfies the Einstein's equation of General Relativity for a curved space-time, demonstrating that space-time geometry within the atom may not be flat. The model relates uncertainty to a particular curved space-time structure. The possibility of curved space-times within the atom generated by Heisenberg pressures provides a subtle link between quantum theory and General Relativity and suggests that quantum theory can be a background dependent model. The geodesic force from the curved space-time generated by the fluid is the same as the electromagnetic force between the electron and the nucleus thus providing internal consistency to the model. The Energy-Momentum-Stress Tensor governing this fluid has an analogy to the tensor used to model Cosmic Microwave Radiation. The uncertainty appears to be largely related to the time transformation resulting from the curved space-time geometry of the fluid.

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