The Relational Blockworld Interpretation of Non-relativistic Quantum Mechanics

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Abstract

We introduce a new interpretation of non-relativistic quantum mechanics (QM) called Relational Blockworld (RBW). We motivate the interpretation by outlining two results due to Kaiser, Bohr, Ulfeck, Mottelson, and Anandan, independently. First, the canonical commutation relations for position and momentum can be obtained from boost and translation operators,respectively, in a spacetime where the relativity of simultaneity holds. Second, the QM density operator can be obtained from the spacetime symmetry group of the experimental configuration exclusively. We show how QM, obtained from relativistic quantum field theory per RBW, explains the twin-slit experiment and conclude by resolving the standard conceptual problems of QM, i.e., the measurement problem, entanglement and non-locality.

Keywords:	Blockworld, non-relativistic quantum mechanics, measurement problem, entanglement.
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