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A Philosopher's View of the Epistemic Interpretation of Quantum Mechanics

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Abstract

There are various reasons for favouring Ψ -epistemic interpretations of quantum mechanics over Ψ -ontic interpretations. One such reason is the correlation between quantum mechanics and Liouville dynamics. Another reason is the success of a specific epistemic model (Spekkens, 2007), in reproducing a wide range of quantum phenomena. The potential criticism, that Spekkens' restricted knowledge principle is counter-intuitive, is rejected using 'everyday life' examples. It is argued that the dimensionality of spin favours Spekkens' model over Ψ -ontic models. van Enk's extension of Spekkens' model (2007) can even reproduce Bell Inequality violations, but requires negative probabilities to do so. An epistemic account of negative probabilities is the missing element for deciding the battle between Ψ -epistemic and Ψ -ontic interpretations in favour of the former.

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