

Probability in GRW Theory

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Abstract

GRW Theory postulates a stochastic mechanism assuring that every so often the wave function of a quantum system is 'hit', which leaves it in a localised state. How are we to interpret the probabilities built into this mechanism? GRW theory is a firmly realist proposal and it is therefore clear that these probabilities are objective probabilities (i.e. chances). A discussion of the major theories of chance leads us to the conclusion that GRW probabilities can be understood only as either single case propensities or Humean objective chances. Although single case propensities have some intuitive appeal in the context of GRW theory, on balance it seems that Humean objective chances are preferable on conceptual grounds because single case propensities suffer from various well know problems such as unlimited frequency tolerance and lack of a rationalisation of the principal principle.

Keywords: Quantum measurement problem, quantum probability, GRW Theory, interpretation of probability, Humean best system, chance.

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