

Quantum Measurements, Propensities and the Problem of Measurement

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Abstract

This paper expands on, and provides a qualified defence of, Arthur Fine's selective interactions solution to the measurement problem. Fine's approach must be understood against the background of the insolubility proof of the quantum measurement. I first defend the proof as an appropriate formal representation of the quantum measurement problem. Then I clarify the nature of selective interactions, and more generally selections, and I go on to offer three arguments in their favour. First, selections provide the only known solution to the measurement problem that does not relinquish any of the explicit premises of the insolubility proofs. Second, unlike some no-collapse interpretations of quantum mechanics selections suffer no difficulties with non-ideal measurements. Third, unlike most collapse-interpretations selections can be independently motivated by an appeal to quantum propensities.

Keywords: quantum mechanics, problem of measurement, insolubility proofs, propensities

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