

# GRW as an ontology of dispositions

Dorato, Mauro and Esfeld, Michael (2009) GRW as an ontology of dispositions.

Full text available as:

[PDF](#) - Requires a viewer, such as [Adobe Acrobat Reader](#) or other PDF viewer.

## Abstract

The paper argues that the formulation of quantum mechanics proposed by Ghirardi, Rimini and Weber (GRW) is a serious candidate for being a fundamental physical theory and explores its ontological commitments from this perspective. In particular, we propose to conceive of spatial superpositions of non-massless microsystems as dispositions or powers, more precisely propensities, to generate spontaneous localizations. We set out five reasons for this view, namely that (1) it provides for a clear sense in which quantum systems in entangled states possess properties even in the absence of definite values; (2) it vindicates objective, single-case probabilities; (3) it yields a clear transition from quantum to classical properties; (4) it enables to draw a clear distinction between purely mathematical and physical structures, and (5) it grounds the arrow of time in the time-irreversible manifestation of the propensities to localize.

**Keywords:** dynamical reduction models, causal properties, dispositions, localizations, propensities, primitive ontology, time arrow

**Subjects:** [General Issues: Laws of Nature](#)  
[General Issues: Causation](#)  
[Specific Sciences: Physics: Quantum Mechanics](#)

**ID Code:** 4870

**Deposited By:** [Dorato, Mauro](#)

**Deposited On:** 02 September 2009