On the Common Structure of Bohmian Mechanics and the Ghirardi-Rimini-Weber Theory

Allori, Valia and Goldstein, Sheldon and Tumulka, Roderich and Zanghi, Nino (2006) On the Common Structure of Bohmian Mechanics and the Ghirardi-Rimini-Weber Theory.

Abstract

Bohmian mechanics and the Ghirardi-Rimini-Weber theory provide opposite resolutions of the quantum measurement problem: the former postulates additional variables (the particle positions) besides the wave function, whereas the latter implements spontaneous collapses of the wave function by a nonlinear and stochastic modification of Schrodinger's equation. Still, both theories, when understood appropriately, share the following structure: They are ultimately not about wave functions but about ``matter'' moving in space, represented by either particle trajectories, fields on space-time, or a discrete set of space-time points. The role of the wave function then is to govern the motion of the matter.

Keywords:	quantum theory without observers, Bohmian mechanics, Ghirardi-Rimini-Weber theory of spontaneous wave function collapse, primitive ontology, local beables
Subjects:	Specific Sciences: Physics: Quantum Mechanics
ID Code:	2811
Deposited By:	Tumulka, Roderich
Deposited On:	27 June 2006