On the Property Structure of Realist Collapse of Quantum Mechanics and the So-Called "Counting Anomaly"

Frigg, Roman (2002) On the Property Structure of Realist Collapse of Quantum Mechanics and the So-Called "Counting Anomaly".

Full text available as:
PDF - Requires a viewer, such as Adobe Acrobat Reader or other PDF viewer.

Abstract

The aim of this paper is two-fold. Recently, Lewis has presented an argument, now known as the `counting anomaly', that the spontaneous localization approach to quantum mechanics, suggested by Ghirardi, Rimini, and Weber, implies that arithmetic does not apply to ordinary macroscopic objects. I will take this argument as the starting point for a discussion of the property structure of realist collapse interpretations of quantum mechanics in general. At the end of this I present a proof of the fact that the composition principle, which holds true in Standard Quantum Mechanics, fails in all realist collapse interpretations. On the basis of this result I reconsider the counting anomaly and show that what lies at the heart of the anomaly is the failure to appreciate the peculiarities of the property structure of collapse interpretations. Once this flaw is uncovered, the anomaly vanishes.

Keywords:	counting anomaly, properies in quantum mechanics, composition principle, conjunction principle, GRW theory, collapse interpretations of Quantum Mechanics, localization.
Subjects:	Specific Sciences: Physics: Quantum Mechanics
ID Code:	851
Deposited By:	Frigg, Roman
Deposited On:	28 October 2002