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SUPERSPOSITION OF STATES IN QUANTUM LOGIC FROM A SET THEORETICAL POINT OF VIEW

The aim of this paper is to study some connections between quantum logic and model theory of set theory. In the research line opened by Benioff and others. Our purpose is to analyse some characteristic operations in quantum logic from the point of view of their “absolutness” with respect to transitive models of *ZFC* theory (Zermelo-Fraenkel + axiom of choice). We begin by recalling some results by Benioff, especially those proving the existence of an isometric monomorphism between a set which is an algebra of bounded operators in a Hilbert space *inside* a *ZFC* model, and such an algebra *outside* the model. We prove that there is an injection between pure states inside and outside a model, when the algebra is that of finite dimensional or \aleph_1 -dimensional operators. By resorting to Cleason’s theorem, we “translate” superposition inside the model to superposition outside the model, and prove that this weak version of the superposition principle is preserved.

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