

Abstract Submitted
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Testability of the Pusey-Barrett-Rudolph Theorem¹ SEYYED MOHAMMAD HASSAN HALATAEI, University of Illinois at Urbana Champaign — Pusey, Barrett, and Rudolph (PBR) proved a mathematically neat theorem which assesses the reality of the quantum state. They proposed a test such that if any pair of quantum states could pass it, then for small deviation in the probabilities of measurement outcomes, ϵ , from the predicted quantum probabilities, one can conclude that the physical state λ “is normally closely associated with only one of the two quantum states.” While the mathematics of their theorem is correct, the physical conclusion is incomplete. In this talk, I present an argument which greatly limits the conclusion one can draw from even a successful PBR test. Specifically, I show that the physical state can be associated with several quantum states and, thus, the reality of quantum states cannot be deduced.

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