Paper Title:

Randomness? What Randomness?

Summary:

This paper seeks to review the ambiguity of randomness in quantum mechanics by examining its antipodal relationship with determinism, computability, and compressibility (i.e. the concept of 1-randomness). First it suggests that randomness is a Wittgensteinian family resemblance through their antipode. This is done by examining and reviewing the history of the idea of randomness in a more general sense. This is followed by an examination of the principle of randomness more closely relating to quantum mechanics. It discusses the Copenhagen interpretation and what its claim of irritability and Leibnizian randomness mean for viable deterministic hidden variable theories (such as Bohmian mechanics and 't Hooft's Cellular Automaton interpretation). In attempt to give a critical assessment of the situation provided in the previous section, this paper explores random sequences and its relation to 1-randomness. Particularly, it looked at a sequence of fair coin flips to create a random binary sequence. It then goes on to argue against the deterministic interpretation of quantum mechanics (such as Bohmian mechanics and 't Hooft's Cellular Automaton interpretation) and it strictly incompatibility with the Born rule.

Points Presented:

- Randomness is a Wittgensteinian family resemblance through their antipode. A Wittgensteinian family resemblance is the phenomena of categorising of a group with no one thing in common, but a network of similarities overlapping. In this case, it is by their antipode, as in being not something such as incompressibility (antipode of compressibility).
- Deterministic interpretation of quantum mechanics is incompatible with the Born rule, which follows the standard Copenhagen interpretation. This is due to the differences between the source of indeterminism. Determinism blames hidden variables while Copenhagen blames nature of the quantum state.
- The difference between Leibniz's prophet and Laplace's demon is that the former appeals to the logical structure of the universe while the latter is by Newtonian Physics

Questions:

1. What exactly is the Copenhagen interpretation of quantum mechanics?
2. What exactly is the Born rule?
3. What's the importance of 1-Randomness?