Two-Slit Computer Experiments with Cellular Automata Models with Strong Anticipation

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One of the most known physical experiments in quantum mechanics and optics is two-slit experiment on transition particles through the screen with two slits. It was important for establishing quantum mechanical description based on probability distribution functions. It is naturally that the mathematical tools of quantum mechanics allow to understand such behavior. However, it is interesting to search the analogs of such experiments in other distributed systems. One of such media for investigation is the cellular automata. It is known that the cellular automata are the media constituted from regularly distributed cells with some states and rules for their evolution. In proposed material the description of analogs of two-slit experiment for cellular automata is proposed. First, let's describe the scheme of a possible computational experiment in the simplest formulation. Let there be a two-dimensional plane subdivision into cells. Each cell has many states, discrete steps in time, and rules for changing states. In the case of strong anticipation, the change in the current state depends on the possible future states (D. Dubois). For the study, a problem with geometry of space was chosen, which corresponds to a well-known problem in a completely different field - two-slit e-speciation in quantum mechanics. Over time, the initial configuration will change, propagating in space take place and non-ziro states passing through hole in a wall. In the case of classical CAs, the status value is unambiguous, ie, each CA cell has one state at a given time, and the configuration is clearly defined. In case of strong anticipation, the possibility of the ambiguity of the states of an individual cell at each moment of time exist. This is reminiscent of the structure of classical quantum mechanics when there is a wave function that gives the probability distribution of the different states from which one measurement process is selected. For such CAs, an analog of probabilistic concepts can be introduced by calculating the number of branches of multi-valued CA that come into each cell.
The results of computer experiments are given. Some interpretations are proposed including distribution of states frequencies during evolution. Particularly oscillations of quantum trajectory is discussed, Also presumable role of strong anticipation in such experiments is described.