Review of: "Computational substantial violation of the CHSH with close approximation of the respective quantum values"

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This is an interesting paper, but I am not certain that it achieves the objectives that the author wants.

A couple of format issues first. The author begins with a partial derivation of the CHSH inequality. Their demonstration is far from obvious but the inequality is so well known in the literature that I don't think a repeat demonstration of its derivation is necessary. The inequality could merely be stated, with a reference if desired.

The author, in introducing their modification of the Glauber-Sudarshan representation, defines an alpha+ and an alpha- parameter, and then states that alpha- = -alpha+. I think it would be simpler to just have the single parameter alpha with the appropriate sign change where needed. The distinction adds nothing to the argument and would simplify it for the reader.

The author spends a great deal of time discussing the computer code used to implement their model. Unfortunately I am not fluent in R programming and cannot comment on the accuracy or validity of the code. I will accept that the author is competent and that the code implements their formulae correctly.

My quibble is whether the argument suffices to show that a local hidden variable model of a quantum mechanical situation can be obtained which violates CHSH. I fully agree with the conclusion, having worked in this area myself and having developed a Process Algebra model of NRQM which can reproduce the wave functions of NRQM to a high degree of accuracy and so reproduce the calculations of NRQM, including violating the CHSH inequality. That model was developed as an alternative formulation of NRQM, with entirely local dynamics, which produced essentially equivalent results. It is a local model, but strictly speaking does not have local hidden variables, not in the sense of Bell. Still it does show that non-locality is not necessary to have NRQM. The work of Dzhafarov and colleagues has demonstrated the violation of an equivalent CHSH inequality in the setting of human decision making, in both group and individual cases. This shows that correlations of CHSH type can occur outside of quantum mechanics, in a classical setting, without recourse to non-locality.

In the present paper, one particular setting is considered, in one particular representation, and additional terms are added to the equation in order to make the demonstration work. There is no motivation to include these terms in the physics - nor is there a demonstration that the essential physics is not altered by the inclusion of these terms. The original equations have a kind of balance (a particular broken symmetry) which is lacking in these modified equations as f modifies only one of these added factor. There is no explanation as to why this should be beyond it somehow reflects

some aspect of the measuring device. To be convincing, one should be assured that the essential physics in not modified in some way by the inclusion of these terms, otherwise it is not really modelling the same situation.

It is also a little troubling that in the simulations, the CHSH violations occurs rarely - I believe about once in 1400 trials. The author takes great care to try to explain why this is not simply a fluctuation in the simulation, a random error as it were. However, given that a great deal of fine tuning is needed to obtain this result, and given that the result is so infrequent, I do not find it convincing. It is true that some fine tuning is needed in the quantum mechanical case to ensure that the CHSH inequality is violated. But that fine tuning involves detector parameters and the particular choice of detector settings - but these are physical and directly observable. Here the fine tuning is physically obscure - it is not clear what the phi parameter relates to in the experiment. Is it a mathematically convenient choice or is it physically determined.

The paper seems sound technically but I am just not convinced that it achieves its goal. Perhaps the argument can be developed in more detail.