An Instantaneous Quantum Computing Algorithm Obviating Restrictions of 'Locality and Unitarity'

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Abstract. Since the mid-1990s theoretical quadratic, exponential, and polynomial Quantum Computing (QC) speedup algorithms have been discussed. More recently, with the advent of the new field of relativistic information processing (RIP) and the introduction of the relativistic qubit (r-qubit) with additional degrees of freedom beyond the current Bloch 2-sphere qubit formalism (which we consider a nonphysical maths convenience) extended theory has begun to appear. In this work, we propose an ultimate form of QC speedup – The Instantaneous Quantum Algorithm (IQA). It should be noted that burgeoning discussion has already occurred on passing beyond the limits of 'locality and unitarity' heretofore restricting the evolution of quantum systems to the standard Copenhagen Interpretation. In that respect, as introduced in prior work, an ontological-phase topological QC model takes advantage of these developments. Simplistically, as well-known by EPR experiments, instantaneous connectivity, albeit still experimentally primitive, exists in the nonlocal arena. As our starting point, we utilize Bohm's work on a 'super-implicate order' where inside a wave packet, a super-quantum potential introduces nonlocal connections. Additionally, from EPR experiments, we are well-versed in entangling simultaneously emitted photon pairs by parametric down-conversion. To operate an IQA, a form of parametric up-conversion is required, entailing a new set of Unified Field Mechanical (UFM) M-Theoretic topological transformations beyond the current Galilean, Lorentz-Poincairé transforms of the standard model. Yang-Mills Kaluza-Klein (YM-KK) correspondence is shown to provide a path beyond the 'semi-quantum limit' to implement IQA.

References

[1] Pitowsky, I. (2002) Quantum speed-up of computations, Philosophy of Science, 69: S168–S177.
[2] Childs, A.M., Cleve, R., Deotto, E., Farhi, E., Gutmann, S. & Spielman, D.A. (2003) Exponential algorithmic speedup by quantum walk, Proceedings of the 35th Symposium on Theory of Computing, Association for Computing Machinery, pp. 59–68; arXiv:quant-ph/0209131.
[3] Lomonaco, S.J. (2016) How to build a device that cannot be built, J. Quantum Information Processing, 15, 3, pp 1043-1056, http://link.springer.com/article/10.1007/s11128-015-1206-7.
[4] Greenberger, D.M., Horne, M. & Zeilenger, A. (1989) Going beyond Bell's theorem, in M. Kafatos (ed.) Bell's Theorem, Quantum Theory, & Conceptions of the Universe, Dordrecht: Kluwer Academic.
[5] Mermin, N.D. (1990) Quantum mysteries revisited, Am. J. Phys. 58, 750, pp 731-734.
[6] Amoroso, R.L. (2017) Universal Quantum Computing: Surmounting Uncertainty, Supervening Decoherence, Hackensack: World Scientific.