Quantum Hypercomputation by means of Evanescent Coherent Photons

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Abstract. In some previous papers we have shown in matter, under suitable conditions for density and temperature, we can have the formation of macroscopic quantum domains, called "coherent domains", due to the common phased oscillations of quantum matter and an e.m. field spontaneously arising from quantum vacuum. Such e.m. field is characterized by a tail of evanescent photons able to tunnelling out from the coherent domains. In this paper we'll show if these photons are used to implement a given computational process, the latter can brake the computational limit imposed by Church-Turing thesis, so allowing to perform an infinite number of computational steps in a finite time, like the hypothetical Zeno - machine. These results then open the door to new and unexplored frontiers in the possible realization of quantum hypercomputation and related applications.