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Abstract for an Invited Paper
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Time-Dependent Density Functional Theory for Universal Quantum Computation

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In this talk, I will discuss how the theorems of TDDFT can be applied to a class of qubit Hamiltonians that are universal for quantum computation. The theorems of TDDFT applied to universal Hamiltonians imply that single-qubit expectation values can be used as the basic variables in quantum computation and information theory, rather than wavefunctions. From a practical standpoint this opens the possibility of approximating observables of interest in quantum computations directly in terms of single-qubit quantities (i.e. as density functionals). Additionally, I will discuss how TDDFT provides an exact prescription for simulating universal Hamiltonians with other universal Hamiltonians that have different, and possibly easier-to-realize two-qubit interactions.