



3. Südosteuropa-Tagung

„Wissenschaftsdialog in Südosteuropa zum Thema Neue Technologien“

**vom 18. bis 20. Oktober 2002
in Zagreb, Kroatien**

Abstracts

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"Quantum computer logic"

We consider algebras underlying Hilbert spaces used by quantum information algorithms. We show how one can arrive at equations on such algebras which define n-dimensional Hilbert space subspaces which in turn can simulate quantum systems on a quantum computer. In doing so we use hypergraphs and linear algorithms. The approach is of a general interest because a transition from an infinite dimensional Hilbert space description of physical systems to a finite dimensional one means a transition from a continuous quantum space to a discrete quantum space. This also means that a quantum computer offers a natural simulation vehicle for discrete quantum mechanics and in turn that the considered finite dimensional Hilbert algebras are suitable for defining a general algebra for quantum computer analogous to the Boolean algebra for classical computers.