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| Contribution Title: | OPTIMIZING THE QUANTUM RANDOM WALK SEARCH ALGORITHM ON THE HYPERCUBE |
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| Invited speaker: | |
| YRS seminar: | YES |

The quantum random walk search algorithm proposed by Shenvi, Kempe and Whaley (SKW algorithm) can be used to search a hypercube of $N$ vertices using $O(\sqrt{N})$ oracle queries. The overall time complexity of the SKW algorithm differs from the best achievable on a quantum computer only by a constant factor. We present improvements to the SKW algorithm regarding query complexity, achieving also the relevant theoretical limit of $(\pi/4)\sqrt{N}$, by boosting the success probability of single runs. We point out which improvements can be applied to the case when more than one elements are marked.