Wave communication across regular lattices

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(Submitted on 2 Jan 2010)

We propose a novel way to communicate signals in the form of waves across a d - dimensional lattice. The mechanism is based on quantum search algorithms and makes it possible to both search for marked positions in a regular grid and to communicate between two (or more) points on the lattice. Remarkably, neither the sender nor the receiver needs to know the position of each other despite the fact that the signal is only exchanged between the contributing parties. This is an example of using wave interference as a resource by controlling localisation phenomena effectively. Possible experimental realisations will be discussed.

Subjects:	**Quantum Physics (quant-ph)**
Journal reference:	Physical Review Letters 103, 260501 (2009)
Cite as:	**arXiv:1001.0335v1 [quant-ph]**

Submission history

From: Gregor Tanner [view email]
[v1] Sat, 2 Jan 2010 21:59:21 GMT (196kb)

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