

Researchers find quantum errors do compute

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(PhysOrg.com) -- Physicists from The University of Queensland have found the emerging field of quantum computing may be more stable than previously thought.

Dr Tom Stace, from UQ's School of Mathematics and Physics, has studied the effect of errors in quantum computers and found with even 50 percent loss of components it could still work.

The theoretical research done with Dr Andrew Doherty from UQ and Dr Sean Barrett from Macquarie University, was recently published in the scientific journal [Physical Review Letters](#).

“Our results demonstrate that relatively large errors and losses can be tolerated, and so may confirm that quantum computers are genuinely feasible,” Dr Stace said.

“What our work shows is theoretically a useful quantum device can be built even if up to 10 percent of its components suffer an error, or up to 50 percent of the components are completely lost.”

Dr Stace said while [quantum computing](#) was still in its early days, it had the potential to revolutionise computers because of its potential to be much more powerful than current computers, especially in fields such as banking where security of transactions is paramount..

“But one of the main challenges of quantum computation is to design a device that is insensitive to errors, even though its constituent elements

are themselves prone to errors,” he said.

“Quantum devices are very sensitive to noise in their surroundings, and their performance can be greatly impaired by errors.

“Our research is therefore focused on how one could build a useful device from imperfect components.

“This theoretical work gives a quantitative idea of how precise quantum engineering needs to be in order to make useful devices.”

More information: link.aps.org/doi/10.1103/PhysRevLett.102.200501

Provided by University of Queensland ([news](#) : [web](#))

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