Peer Review of Group 14 by Group 8

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1   Summary of the paper

Microwave drivers are key electronic components of the architectures that control experimental quantum processors. As quantum computers scale up to sizes necessary for fault-tolerance, the use of conventional room-temperature controls face new challenges. The paper introduces and outlines approaches to scaling up control while limiting delay times (by bringing control architectures closer to the quantum processor) and keeping the number of control lines small (scaling sub-linearly with number of qubits). A review of the state-of-the-art mentions two key recent developments in cryogenic microwave driver technology.

2 Quality of the content

2.1 Have all points been addressed?

2.1.1 Are microwave drivers required for solid-state qubits?

2.1.2 Room temperature vs cryogenic MW drivers: pros and cons.

2.1.3 Advantages and requirements of FDMA.

2.1.4 Implications of cryogenic electronics on MW driver design.

2.2 Other important points that have been treated

2.3 Analysis of state of the art

3 Clarity of the paper

3.1 Structure

The paper was properly structured and followed the order outlined in the introduction, making it very easy to read. One suggestion would be to have made the "Multiplexing Techniques" and "Microwave Drivers at Cryogenic Temperatures" sections into sub-sections under a section head entitled "Proposed Solutions". This would have made the structure clearer and would have coincided better with the paper overview given at the end of the introduction.

3.2 Language

The language was very clear. A writing style of short, declarative sentences broke down larger concepts effectively. The paper was grammatically correct throughout with hardly any typos or other mistakes. It was well-written and clearly proof-read several times.

3.3 Formatting

There were no figures and the one equation in the paper was well formatted with well defined symbols. The bibliography is well formatted and complete with helpful links for references throughout the paper and DOI links in the reference list.

4 Additional remarks

Paper found an interesting way of illustrating the implications of cryogenic temp on driver design using the current state of the art. Accomplished a lot in one section.