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Microwave to optics conversion using mechanical oscillators

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Conversion between signals in the microwave and optical domains is of great interest, particularly for connecting future superconducting quantum computers into a global quantum network. The idea is to transduce microwaves that are usually lost after a mere few centimeters into an optical signal which does allow transmission of quantum information over tens or even hundreds of kilometers. Here we would like to discuss two recent important steps in realizing such a practical device by demonstrating coherent conversion between GHz signals and the optical telecom band with minimal thermal background noise, while also exploring a new and low-loss piezoelectric material for this process.

In collaboration with: Moritz Forsch, Kavli Institute of Nanoscience and Robert Stockill, Kavli Institute of Nanoscience

References

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