



Physical Sciences Seminar

Harnessing electro-optic correlations to improve an efficient mechanical converter

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A mechanical link between superconducting circuits and the optical domain is an appealing route to a large-scale quantum network. We show that vibrational noise -- ubiquitously introduced by such a link -- can be overcome by harnessing microwave-optical correlations. We construct a microwave-mechanical-optical converter operating at 100 mK, and demonstrate an unprecedented conversion efficiency of 47%. Discovering that vibrational noise produces correlations between microwave and optical outputs, we implement a classical feedforward protocol that improves the recovery of a weak, upconverted signal and reduces noise by 59%, to 38 photons of added noise, for this high-efficiency device. Our results introduce an intriguing alternative method for handling errors introduced by thermal noise.

Friday, April 20, 2018 02:00pm - 03:30pm

IST Austria Campus Mondi Seminar Room 1, Central Building



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