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Sensing feeble microwave signals via an optomechanical transducer[1] KEYE ZHANG, Quantum Institute of Light and Atoms, Department of Physics, East China Normal University, Shanghai, P.R. China, FRANCESCO BARIANI, YING DONG, College of Optical Sciences, University of Arizona, Tucson, AZ, USA, WEIPING ZHANG, Quantum Institute of Light and Atoms, Department of Physics, East China Normal University, Shanghai, P.R. China, PIERRE MEYSTRE, College of Optical Sciences, University of Arizona, Tucson, AZ, USA — Due to their low energy content microwave signals at the single-photon level are extremely challenging to measure. Guided by recent progress in single-photon optomechanics and hybrid optomechanical systems, we propose a multimode optomechanical transducer that can detect intensities significantly below the single-photon level via off-resonant adiabatic transfer of the microwave signal to the optical frequency domain where the measurement is then performed. The influence of intrinsic quantum and thermal fluctuations on the performance of this detector are considered in detail.

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