Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Planck Spectroscopy and the Quantum-Mechanics of Microwave Beam splitters[1] MATTEO MARIANTONI, EDWIN P. MENZEL, FRANK DEPPE, MIGUEL ANGEL ARAQUE CABALLERO, ALEXANDER BAUST, ELISABETH HOFFMANN, TOMASZ NIEMCZYK, ACHIM MARX, RUDOLF GROSS, Walther-Meissner-Institut and TU Muenchen, Germany, ENRIQUE SOLANO, Universidad del Pais Vasco and Ikerbasque Foundation (Bilbao, Spain) — Beam splitters occupy a central role in quantum optical architectures. We present an experimental study on the quantum-mechanical behaviour of microwave beam splitters based on a cross-correlation heterodyne detector. This method allows us to measure the covariance matrix of thermal states at the beam splitter input ports. Each matrix element represents a Planck distribution as a function of both temperature and frequency. Such a Planck spectroscopy makes possible to set an experimental limit to the measurement of vacuum fluctuations and unveils the partition noise properties of microwave beam splitters.

[1]We acknowledge support from SFB631, NIM, the Ikerbasque Foundation, UPV/EHU Grant GIU07/40, and European project EuroSQIP

Matteo Mariantoni
Walther-Meissner-Institut and TU Muenchen, Germany

Date submitted: 02 Dec 2009 Electronic form version 1.4