

# A model of calorimetric measurements in an open quantum system

I will discuss a mathematical model of the experimental setup planned by Jukka Pekola and collaborators in [New J. Phys., 15, 115006 (2013)]. The aim of the experiment is to detect quanta of energy absorbed or emitted by a driven quantum system by measuring the temperature variation of the environment surrounding it.

The theoretical model consists of a periodically driven qubit coupled with a large yet finite electron reservoir, the calorimeter initially at equilibrium with an infinite phonon bath. Under weak coupling assumptions, the evolution of the qubit-calorimeter system can be described by a generalized quantum jump process including as dynamical variable the temperature of the calorimeter. Such Markovian approximation yields detailed analytical and numerical information about the temperature statistics versus the intensities of the drive.

The talk is based on joint work with Brecht Donvil, Antti Kupiainen, Jukka Pekola and Kay Schwieger, [Physical Review E, 2016, 94, 062127] and [Physical Review A, 2018, 97, 052107].