Abstract:
Driven linear and non-linear photonic cavities are extensively studied. Indeed, it can exhibit non-reciprocity[1], frequency conversion[2], thermal cooling[3], .... It is known that injected noise in a bistable modulated system can lead to periodic transitions between stable states, a phenomenon called stochastic resonance[4]. Recently, it has been shown both experimentally and numerically that such phenomenon can, for example, enhance energy harvesting[5]. Here, for the first time, we present stochastic resonance resulting from temperature-induced noise as well as a modulated monochromatic pump. We study thermal radiation and outgoing power from a non-linear photonic cavity coupled to an external channel. The cavity is driven by a modulated monochromatic pump and its mode evolution is described as a stochastic process due to temperature-induced noise. Such system exhibits frequency conversion and paves the way for temporal control of radiative heat transfer. We also suggest a semi-analytical approach for the estimation of coherent outgoing power into the external channel in the stochastic resonance regime.

References