Canadian Association of Physicists

Association canadienne des physiciens et physiciennes

Contribution ID: **584** Type: **Invited Speaker / Conférencier(ère) invité(e)**

(I) Quantum electromechanics: photon conversion, nonreciprocity, and entanglement

Wednesday 9 June 2021 16:50 (5 minutes)

Here I discuss the possibilities to use nanomechanical resonators to converter information between microwave and optical domains. Additionally, I demonstrate an on-chip magnetic-free circulator based on reservoir-engineered electromechanical interactions. Directional circulation is achieved with controlled phase-sensitive interference of six distinct electromechanical signal conversion paths. Finally, I show that a parametrically driven mechanical oscillator can entangle electromagnetic fields. We observe stationary emission of path-entangled microwave radiation from a micro-machined silicon nanostring oscillator, squeezing the joint field operators of two thermal modes by 3.40 (37) ˜ dB below the vacuum level.

Author: Prof. BARZANJEH, Shabir (University of Calgary)

Presenter: Prof. BARZANJEH, Shabir (University of Calgary)

Session Classification: W4-1 Quantum Information: Experiments (DAMOPC) / Information quantique: expériences (DPAMPC)

Track Classification: Atomic, Molecular and Optical Physics, Canada / Physique atomique, moléculaire et photonique, Canada (DAMOPC-DPAMPC)