Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **591** Type: **Invited Speaker / Conférencier(ère) invité(e)**

(I) Polarization control of spontaneous emission for rapid quantum state initialization

Monday 7 June 2021 15:55 (5 minutes)

We propose an efficient, nanoplasmonic method to selectively enhance the spontaneous emission rate of a quantum system by changing the polarization of an incident control field, and exploiting the polarization dependence of the system's spontaneous emission rate. This differs from the usual Purcell enhancement of spontaneous emission rates as it can be selectively turned on and off. Using a three-level system in a quantum dot placed in-between two silver nanoparticles and a linearly-polarized, monochromatic driving field, we present a protocol for rapid quantum state initialization; while maintaining long coherence times for control operations. This process increases the overall amount of time that a quantum system can be effectively utilized for quantum operations, and presents a key advance in quantum computing.

Author: RANGAN, Chitra (University of Windsor)

Presenter: RANGAN, Chitra (University of Windsor)

Session Classification: M3-1 Nonlinear and Quantum Optics (DAMOPC) / Optique non linéaire et optique quantique (DPAMPC)

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