Contribution ID: **228** Type: **Invited Speaker / Conférencier invité**

Ultracold Rydberg atoms and hybrid quantum systems

Wednesday 18 June 2014 09:15 (30 minutes)

Rydberg atoms — large atoms with a highly excited, loosely bound electron — may enable hybrid quantum systems, combining the long coherence times of atomic systems with the strong interactions of solid-state devices. However, this will require atoms to be located near a heterogeneous surface with exposed metal electrodes and dielectric insulators, which are sources of uncontrollable and unwanted electric fields. With this motivation, we have measured both the static [1] and time-varying [2] electric fields near the heterogeneous metal-dielectric surface of an atom chip using cold Rydberg atoms. We have also developed a technique for reducing the influence of dc and low-frequency electric fields on Rydberg atom transitions, while retaining their sensitivity to high-frequency resonant fields [3].
[1] J. D. Carter, O. Cherry, and J. D. D. Martin, Phys. Rev. A, v. 86, 053401 (2012)
[2] J. D. Carter and J. D. D. Martin, Phys. Rev. A, v. 88, 043429 (2013).
[3] L. A. Jones, J. D. Carter, J. D. D. Martin, Phys. Rev. A, v. 87, 023423 (2013).

Primary author: Prof. MARTIN, James (University of Waterloo)

Presenter: Prof. MARTIN, James (University of Waterloo)

Session Classification: (W1-6) Cold Atoms and Molecules - DAMOPC-DCMMP / Atomes froids et molécules - DPAMPC-DPMCM

Track Classification: Division of Atomic, Molecular and Optical Physics, Canada / Division de la physique atomique, moléculaire et photonique, Canada (DAMOPC-DPAMPC)