



Contribution ID: 347

Type: **Invited Speaker / Conférencier invité**

****WITHDRAWN** Application of swept fiber-laser based imaging and spectroscopy systems in security, industrial and medical markets**

Thursday 19 June 2014 16:30 (30 minutes)

Genia Photonics has developed a robust, easy-to-use, fiber-based source for multimodal imaging and spectroscopic solutions directed at in-vivo imaging. Optical Coherence Tomography, Second Harmonic Generation, Coherent Anti-Stokes Raman Scattering (CARS) and Stimulated Raman Scattering (SRS) have already been demonstrated with the system on in-vitro and ex-vivo samples. Other techniques such third harmonic generation, or time-resolved fluorescence could also be performed with the same system. The system is based on the electronic tuning and synchronization of two fiber lasers, and includes data acquisition cards developed for Genia as well as detectors (from photomultiplier tubes to balanced detectors). The system includes a fully programmable laser control software and the complete data acquisition and analysis software. We will present results on gas analysis, multimodal imaging of cryosections as well as ex-vivo tissue analysis. One of the potential applications being tumor-resection margins but other applications are also of interest. This system was built from the ground up for harsh industrial environments and for the high reliability requirements for clinical use. We are seeking partners interested in multimodal imaging and spectroscopy-based diagnostics particularly for in-vivo hyperspectral imaging and diagnostics. Furthermore, the same system was also used to produce a widely tunable infrared sources (WTIRS) by Difference Frequency Generation (DFG) techniques without the need for angle or temperature tuning. The WTIRS potential was demonstrated by measuring different gases or simply atmospheric transmission at high speed, high resolution, and high sensitivity. We are also seeking partners for IR spectroscopy-based applications in industrial or clinical settings.

In conclusion, Genia is offering a vibrational spectroscopy system tailored for near-IR nonlinear spectroscopy such as CARS or SRS with all the advantages of near-IR light: high resolution, long penetration depth, low noise detection, and/or IR linear spectroscopy with all the advantages of high sensitivity due to the strong absorption in the IR. Genia offers systems for both regions of importance for molecular vibrational spectroscopy, the high wavenumber (2700-3400 cm⁻¹, 2.9-3.7 μm) and the so-called fingerprint region (1000-1530 cm⁻¹, 6.5-10 μm systems and targeting up to 12 μm).

Author: VILLENEUVE, Alain (Genia Photonics)**Presenter:** VILLENEUVE, Alain (Genia Photonics)**Session Classification:** (R3-2) Biophotonics II - DAMOPC-DIAP / Biophotonique II - DPAMPC-DPIA**Track Classification:** Division of Atomic, Molecular and Optical Physics, Canada / Division de la physique atomique, moléculaire et photonique, Canada (DAMOPC-DPAMPC)