



Laboratoire de Glaciologie et Géophysique de l'Environnement

## Séminaire

*Mercredi 27 Avril 2016, 9h30*  
Salle L. Lliboutry, LGGE

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### *Couplage climat-géochimie*

*via des méthodes laser innovantes:*

*à l'interface entre sciences de l'environnement et optique*

In this talk I will speak about different applications of innovative laser based optical techniques for environmental science. Thanks to the compactness, reliability, high sensitivity and precision, these methods are nowadays replacing more bulky and complex analytical methods (such as chromatographs and mass spectrometers) for environmental sensing. They provide improved or at least comparable performance, while overcoming several key limitations (including, among others, independently calibrated measurements, resolution of isobaric interferences, and high time resolution for laboratory and field measurements).

In the talk I will cover application in the field of ice cores science for studying the climate of the past, going from high precise measurement of isotopic composition of past atmosphere to in-situ tools for evaluating potential sites where the oldest ice can be found (SUBGLACIOR project) [1-2], ocean science for high resolution measurement of dissolved gases, and the detection of high reactive species (halogen oxides radicals and NO<sub>x</sub>) for better constrain the oxidative capacity, for instance, at polar regions. [3]

- [1] J. Chappellaz, O. Alemany, D. Romanini, and E. Kerstel, "The IPICS « oldest ice » challenge : a new technology to qualify potential sites," *Ice Snow*, vol. 4, pp. 57-64, 2012.
- [2] R. Grilli, N. Marrocco, T. Desbois, C. Guillerm, J. Triest, E. Kerstel, and D. Romanini, "Invited Article : SUBGLACIOR : An optical analyzer embedded in an Antarctic ice probe for exploring the past climate," *Rev. Sci. Instrum.*, vol. 85, no. 111301, pp. 1-7, 2014.
- [3] R. Grilli, M. Legrand, A. Kukui, G. Méjean, S. Preunkert, and D. Romanini, "First investigations of IO,

BrO, and NO<sub>2</sub> summer atmospheric levels at a coastal East Antarctic site using mode-locked cavity enhanced absorption spectroscopy," *Geophys. Res. Lett.*, vol. 40, pp. 1–6, Feb. 2013.