W Chen et al., J Phys Chem Biophys 2015, 5:4
http://dx.doi.org/10.4172/2161-0398.C1.013

OMICS International
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3rd International Conference and Exhibition on
Lasers, Optics & Photonics
September 01-03, 2015 Valencia, Spain

Advanced photonic technologies for atmospheric measurements

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Chemically reactive atmospheric species play a crucial role in tropospheric processes that dominate regional air quality and global climate change. Contrary to long-lived species (such as greenhouse gases), real time *in situ* sensing of short-lived atmospheric molecules represents a real challenge due to their very high reactivity resulting in short lifetimes (of around 1-100 seconds) and ultra-low concentrations that measure in parts per billion by volume (PPBV) to parts per quadrillion by volume (ppqv). In this talk, we will overview our recent progress in the development of photonic instruments for *in situ* monitoring of such atmospheric species (like nitrous acid (HONO), nitrate radical (NO_3), nitrogen dioxide (NO_2). The experimental arrangements, based on the advanced photonic technologies (such as quantum cascade laser, light emitting diode) combined with selective and sensitive long optical path length enhanced absorption spectroscopy, as well as their applications to field observation and smog chamber study will be presented.

Biography

W Chen is full Professor of Physics at the Université du Littoral Côte d'Opale (ULCO) in France. He received his PhD degree in 1991 from the Université des Sciences et Technologies de Lille (USTL) in France. Prior to joining the ULCO in 1993, he was an Assistant Professor at the USTL where he conducted research focusing on the development of laser sideband-based heterodyne THz spectrometer and its application to molecular rotation spectroscopy. His current research interests include developments and applications of photonic instrumentation (based on QCL, LED or optical parametric source) for optical metrology of atmospheric species: Trace gases (concentration, isotope ratios) and aerosols (optical properties). He has published more than 130 refereed technical papers and has co-authored over 140 presentations in the international conferences.

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