



Development of a continuous-wave quantum cascade laser instrument for atmospheric measurements of HONO near 1255 cm^{-1}

Xiaojuan Cui (1,2), Weidong Chen (1), Eric Fertein (1), Wenqing Liu (2), Yujun Zhang (2), and Fengzhong Dong (2)

(1) Laboratoire de Physicochimie de l'Atmosphère, Université du Littoral Côte d'Opale, 189A, Av. Maurice Schumann, 59140 Dunkerque, France (chen@univ-littoral.fr), (2) Anhui Institute of Optics & Fine Mechanics, CAS, Hefei, 230031, China

Gaseous nitrous acid (HONO), as an important hydroxyl (OH) free radical source in the atmosphere by photolysis at dawn, plays a very important role in the atmospheric chemistry of irradiated mixtures of VOC and NO_x. It is also an important precursor for OH radicals in simulation chambers. Concentration measurement of atmospheric HONO requires high sensitivity, good temporal and spatial resolution. Tunable diode laser spectrometry (TDLS) provides advantage in terms of sensitivity (due to the laser source) and spatial resolution (due to point sampling) in comparison with the currently used spectroscopic instruments (FTIR and DOAS). In this paper, we report on the development of a TDLS instrument for atmospheric HONO detection, based on a continuous wave, room temperature operation quantum cascade laser (QCL) emitting at about 1254.7 cm^{-1} at $20\text{ }^{\circ}\text{C}$ with an output power of up to 35 mW. Experimental details will be presented and discussed.