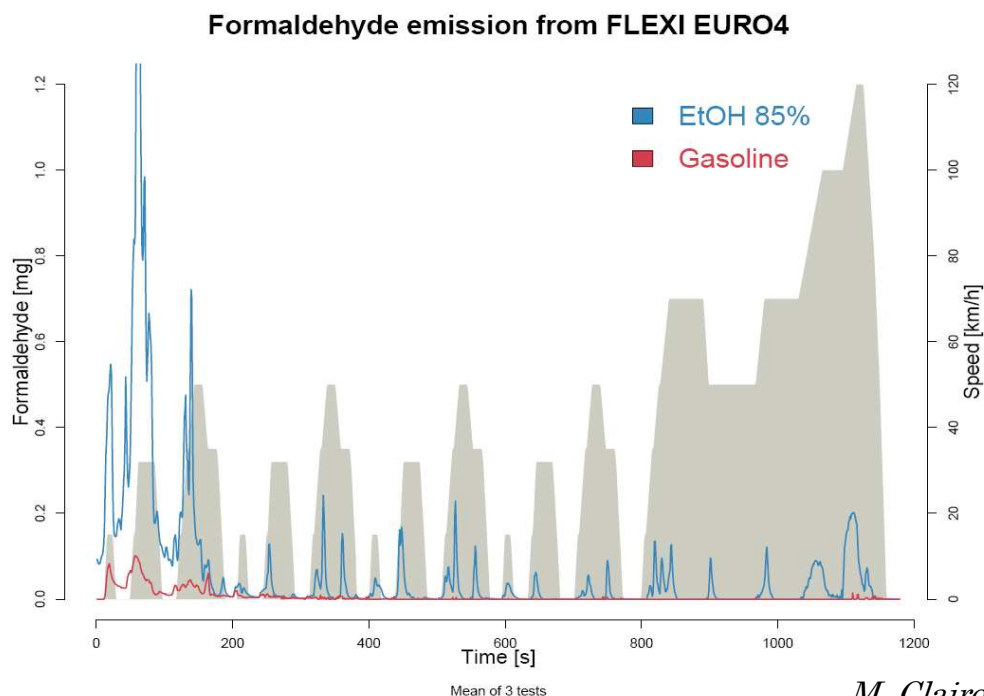


## Gas phase measurements by FT IR

The gas was sampled with a PTFE heated line (191°C) directly at the tailpipe before the cyclone, in order to avoid any losses all along the surface of the sampling equipment or the dilution tunnel. Indeed, some compounds like ammonia or nitrogen dioxide are well known for their capacity to remain adsorbed on the sampling system surface, mostly in the presence of condensed water (Hoard et al. 2007). Firstly, small chain HC (saturated and unsaturated with less than 4 carbons), nitrogen species (NO, NO<sub>2</sub>, N<sub>2</sub>O, NH<sub>3</sub> and HCN) and other oxygenated small compounds (formaldehyde, acetaldehyde) have been monitored by a High Resolution Fourier Transform Infrared spectrometer (HR-FTIR). This system is a quantitative technique based on a Partial Least Square (PLS) models which allow predicting the concentration of 20 exhaust compounds from gasoline engines. A minor amount of the exhaust flow (4.5-5 L/min) is constantly directed into the FTIR multipath optical cell (5.11m) at atmospheric pressure. Then, the gas sample absorbs a part of an IR beam, generated by a Michelson interferometer (600-3500cm<sup>-1</sup> spectral range, and 0.5cm<sup>-1</sup> spectral resolution). Transmitted signal is registered by a Mercury Cadmium Telluride (MCT) detector cooled with liquid nitrogen. The absorbance spectrum is obtained after a mathematical Fourier Transformation of the beam detected, and subtraction of daily recorded background spectra. The acquisition frequency was set to 1Hz, with a multivariate calibration based on a factory developed model supported by a Labview software.



*M. Clairotte 2010*