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Evaluation of the Picarro EnviroSense 3000i analysers (now called G1301) for continuous CO2/CH4 measurements

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Appeared in the late 1980's, the cavity ring-down spectroscopy (CRDS) is now a well established technique which is more and more used for the high precision trace gas measurements. Several characteristics of CRDS make it attractive for a deployment of such instrument in the greenhouse gas monitoring network: combined measurements of several trace gases, high sensitivity and good linearity, field deployable, low maintenance, etc... During the last year the LSCE RAMCES group had the possibility to evaluate the EnviroSense CRDS analyzer (now called G1301), marketed by Picarro Inc. and designed for continuous measurement of CO2, CH4 and H2O. Also, the LSCE RAMCES group installed in August 2008 one of these instruments in Ivory Coast within the CarboAfrica project.

The poster presents in a first part the different tests that have been done at LSCE with two EnviroSense 3000i analysers. We estimated the precision and the repeatability of the instruments. We also evaluated the stability by measuring regularly a set of calibration gases. This allowed us also to quantify the calibration factors to convert the measurements in our CO2 and CH4 reference scales. We checked for the sensitivity of the analyser to the ambient temperature, to the flow rate of the gas sample, and to the water vapour content. Finally, we compared the EnviroSense instruments to a gas chromatographic system for CH4 measurements and to a LOFLO-2D NDIR spectrometer for CO2. In a second part, we present our experimental setup in Ivory Coast and our first results obtained with the Picarro EnviroSense running on the field.