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Implementation of experimental CRDS and DOAS systems for determination of gases with direct green house effect

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The implementation of the experimental spectroscopic systems address stringent problems related to the control of gases emissions with direct green house effect as: CO2, CH4,NOx.
CRDS (Cavity Ring – Down Spectroscopy) and DOAS (Differential Optical Absorption Spectroscopy) are versatile, fast-response techniques and can contribute to the improving of the quality of air, especially in large cities and industrial areas as well as the improving the meteorological prognosis.
Firstly, we describe an CRD system for measurements of the optical absorption of water and for determination of the optical properties of gases with direct green house effect from ambient air.
Secondly, a DOAS system provides measurements for the detection and characterization of atmospheric pollutants.
The data obtained in the two systems: CRDS and DOAS are correlated in the aim of pollutant concentrations monitoring in different humidity conditions. The humidity is a main factor in the concentration and the dispersion of atmospheric pollutants.
The analysis of how different compositions of pollutants answer to humidity have a significant impact upon the uncertainties regarding the modeling of pollutants impact on the climate.
The potential of CRDS and DOAS techniques in the study of the environmental pollution and in the laboratory fundamental research is proved by their sensitivity better than 1 ppm.
In addition to DOAS system, gases standards and calibrated established point monitors for SO2, NOx and O3 are integrated in the measurement approach and tests in order to validate our CRDS first experimental set-up.