



Intercomparison study of atmospheric methane and carbon dioxide concentrations measured at the Ebre River Delta Station

Paola Occhipinti (1), Josep Anton Morguí (1,2), Alba Àgueda (1), Oscar Batet (1), Sílvia Borràs (1,4), Lúdia Cañas (1), Roger Curcoll (1), Claudia Grossi (1), Manel Nofuentes (1), Eusebi Vazquez (1,2), Xavier Rodó (1,3)
(1) Institut Català de Ciències del Clima (IC3), Barcelona, Spain, (2) Departament d'Ecologia, Universitat de Barcelona (UB), Barcelona, Spain, (4) Departament de Química Analítica, Universitat de Barcelona (UB), Barcelona, Spain, (3) Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain

In the framework of the ClimaDat project, IC3 has established a network of eight monitoring stations across the Iberian Peninsula and the Canary Archipelago with the aim of studying climate processes. The monitoring station at the Ebre River Delta (DEC3) is located in the Ebre River Delta Natural Park (40° 44' N; 0° 47' E) and it is characterized by the typical North-Western Mediterranean climate. Since 2013, atmospheric greenhouse gases (GHG) and ²²²Rn tracer gas together with the meteorological parameters are continuously measured from a 10 m a.g.l. height tower. Atmospheric GHG (CO₂, CH₄, CO and N₂O) concentrations are determined using a Picarro analyzer G2301 (CO₂ and CH₄) and a modified gas chromatograph (GC) Agilent 6890N (CO₂, CH₄, CO and N₂O). Open data access is available from the www.climadat.es website. Data collected at the DEC3 station are also submitted to the InGOS platform since this station is part of the InGOS European infrastructure project.

Researchers from the Laboratory of the Atmosphere and the Oceans (LAO) at IC3 have performed an intercomparison study at the DEC3 site between three different Picarro analyzers (two Picarro G2301 and one Picarro G2301M), a Los Gatos Research (LGR) analyzer and the GC system already installed at the station. The aim of this study is to compare and assess the measuring agreement between the four optical gas analyzers and the GC. In the first part of the experiment, all instruments have been calibrated using NOAA gases as primary standards analyzing five Praxair provided targets to evaluate the precision of the measuring instruments. Max Plank Institute (MPI) gases have been used as secondary standards for the GC whereas Praxair provided tanks are used as secondary standards for the Picarro and the LGR analyzers. In the second part of the experiment, atmospheric GHG were measured from natural atmospheric air taken from a 10 m a.g.l. inlet. Daily cycles of GHG measurements were carried out using different instruments simultaneously over a period of 24 hours, coupling the GC with a combination of two optical analyzers per time. Precision results together with the evaluation of the advantages and drawbacks of the use of these different GHG measuring instruments will be discussed.

The intercomparison study here presented will be implemented by carrying it out at each of the eight ClimaDat monitoring stations in Spain, representing a quality control system for the analysis of GHG in the ClimaDat network.