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Spring-summer atmospheric CO2 variability in La Muela Tall Tower site (41º36'N, 1º6'W) in relation with wind backtrajectories.

R. Curcoll, A. Font, J-A. Morguí, I. Pouchet, M-A. Rodríguez and X. Rodó
Climate Research Laboratory, Science Park in Barcelona, University of Barcelona

Baldiri i Reixach 4-6, Torre D, 08028 Barcelona, Catalonia, Spain (rcurcoll@pcb.ub.cat)

Continuous in-situ atmospheric CO_2 measurements in La Muela Tall Tower (LMU 41º36'N, 1º6'W, in the middle of the Ebre watershed) are carried out since May 2006 at three different altitudes (79, 57 and 41 m above ground level; ground level 570 m above sea level).

Four-days-backwards GFS-NOAA-NCEP/FLEXPART Lagrangian Dispersion Model simulations have been used to calculate back trajectories of air and the residence time on the Footprint Layer (0-300 magl) for air masses arriving at LMU at 0 and 12 a.m. each day. This method allows to analyze the main trajectories of the air arriving at LMU and the possible main source areas of CO_2 mixing ratio variability.

Spring and summer' 2007 CO_2 mixing ratios in LMU have been evaluated in relationship to definite source areas and different synoptic conditions.

Winds come to LMU mainly following the Spanish major rivers watersheds and also crossing the Pyrenean and Iberian ranges by N-S valleys. Origin of air masses analyzed for CO_2 in LMU are: a) Eastern winds are originated in the western Mediterranean Sea and North Africa, b) North winds come from Landes (SW coast of France) and cross the Pyrenees, c) North-Western winds are from the open waters of the Atlantic Ocean, d) Western winds are from the western lands of the Iberian Peninsula and e) Southern winds are mainly from Central and South of the Iberian Peninsula.

These winds have each a particular CO_2 mixing ratio signature in LMU.

Moreover, looking at this CO_2 mixing ratios, the biological cycle of some neighborhood regions can be captured in function of the direction of the wind fields reaching LMU.