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CO2 sinks and sources from the record obtained in the atmospheric Tall Tower station in LMU (La Muela, Spain)

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Continuous in-situ atmospheric CO2 measurements at 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).

Local and advected CO2 influence the diurnal CO2 atmospheric signal in LMU. A method for analyzing both the diurnal cycle release and capture of CO2 has been developed. The atmospheric CO2 series can be splitted into the daily source and the daily sink series.

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. Four-days-back trajectories allow identifying the possible main influence areas for the air masses arriving at LMU.

Therefore, coupling these two methods allows estimating sources, sinks, and trends at the different time scales for the different main upcoming wind trajectories arriving in La Muela. 2008 CO2 mixing ratios in LMU have been evaluated in relationship to well definited source areas and different synoptic conditions.