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The application of an air masses classification to interpret ozone exceedances at Ebre Observatory (northeast Spain).

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The surface ozone threshold to protect human health is exceeded frequently between March to September months in the low Ebre valley, rural area located in the NE of Spain. In order to interpret the causes of these exceedances has been performed a classification of the origin of the air masses in days in which the maximum daily 8h mean concentration of ozone surpasses the value of 120 μg m^{-3}, from 1994 to 2005.

The air masses trajectories have been computed using HYSPLIT model with 5-days back trajectories to an altitude of 500 m. The arrival of trajectories to Ebre Observatory may be from NW (40%) or SE (60%) according to the valley axe. The analysis of 245 trajectories shows five origin areas: Atlantic, European, Mediterranean, Iberian Peninsula and coastal area of Spanish eastern.

The Atlantic air masses reach the Ebre from the NW and present a low frequency of occurrence (7%) with two clear situations, directly from the Atlantic or crossing France where very probably is loaded with ozone. The air masses with origin in the Iberian Peninsula and coastal areas of the Spanish eastern present similar occurrence, 11 to 14 %. In these cases the ozone formed inland or in coastal zones may be transported toward the measurement point arriving generally from SE.

The major percentage of trajectories is found with origin in Europe and in the Mediterranean Sea, 43 and 24 % respectively, pointing out this result that very probably the

most important ozone source in this rural area will be the transport from these regions. The European trajectories present two possible pathways; the first coming from Central Europe and the second type are air masses from of the North. While the Mediterranean trajectories are maritime air masses which transport ozone along the western Mediterranean basin.

Overall, trajectories from Mediterranean and European areas were obtained with major frequency in all months, although in the period from May to August the variability of air masses types has been higher.

The results obtained in this work suggest that the occurrence of elevated ozone levels in this area could be caused mainly for long and medium range transport processes from continental and maritime areas. At present this investigation continue in order to identify and characterise with detail the meteorological patterns that produce this ozone transport having as consequence the exceedance of the values limits.