Title:	Meteorology during the DOMINO campaign and its connection with trace gases and aerosols
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Abstract:	The DOMINO (Diel Oxidant Mechanisms in relation to Nitrogen Oxides) campaign was carried out from 21 November to 8 December 2008 at the El Arenosillo station (SW of Spain) in a coastal-rural environment. The main weather conditions are analysed using local meteorological variables, meteorological soundings and synoptic maps, as well as back trajectories of the air masses using the HYSPLIT (Hybrid Single-Particle Lagrangian Integrated Trajectory Model) model and a high spatial resolution of meteorological fields. Measurements of the main meteorological parameters were collected both from the surface and from a tall tower. A detailed land use analysis was performed on a 80 km scale showing the main types of vegetation and land use. Also the main anthropogenic atmospheric emission sources-both industrial-urban from Huelva and from the urban Seville area-are shown. A study to identify air mass origins and their variation with height was carried out. In this intensive campaign, air masses coming from different areas with different emission sources were observed: from the NW, with a highly industrial-urban character; continental flows from northerly directions; from the NE, with a pathway starting over the Seville metropolitan area and then continuing over the Doñana National Park; and maritime air masses coming from the Atlantic Ocean. To study the chemistry in the four atmospheric scenarios identified, gas-phase measurements of primary and secondary species such as ozone, NO, NO2 and SO 2, biogenic and anthropogenic VOCs (volatile organic compounds) like benzene and isoprene, as well as total particle concentration and chemical composition of the aerosols are compared and discussed. The highest levels for total particle concentration, NO, NO2, SO2, benzene, PM10, PM2.5 and chemical elements such as As or Cu were found under flows associated with industrial-urban emissions from the Huelva-Portugal sector which are transported to the site before significant removal by chemical or deposition mechanism can occur. The air masses from the north were affected mainly by crustal elements and biogenic sources, the latter being exemplified by the biogenic species such as isoprene, particularly in the first part of the campaign. The urban air from the Seville area, before arriving at El Arenosillo, traversed the Doñana National Park and therefore was affected by industrial-urban and biogenic emissions. This aged air parcel can transport low levels of NOx, total particle concentration and SO 2 as well as ozone and isoprene. Marine air masses from the Atlantic Ocean influence El Arenosillo frequently. Under these conditions, the lowest levels of almost all the species-with the exception of ozone levels associated to long-range transport-were measured.
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