EMS Annual Meeting Abstracts
Vol. 16, EMS2019-371-1, 2019

Synoptic characterization of daily air quality in Basque Country

Santiago Gaztelumendi (1,2), Aurelio Diaz de Arcaya (1), Ivan R. Gelpi (1,2)

(1) Tecnalia R&I, Energy and Environment Division, Meteorology area, Vitoria-Gasteiz, Basque Country., (2) Basque Meteorology Agency (Euskalmet), Vitoria-Gasteiz, Basque Country.

Air pollution is an important public health problem, as many studies all around the world have consistently shown. The Air Quality Monitoring Network of the Basque Country measures on a real time basis, different pollutant covering a wide range of atmospheric environments from regional background to urban and industrial sites. The air quality evaluation process consists of assessing certain pollution levels present in the ambient air. This process is ongoing using the daily air quality index, which assesses the state of the air quality with a category defined according to a concentration range of main pollutants measured.

A detailed analysis of air quality index is done at daily scale for the whole territory and main cities investigating relationships in between exceedance values and meteorological aspects. A classification of synoptic circulation patterns is used in order to identify the large-scale weather systems that affect poor air quality ambient over the country. Good air quality occurs during unstable, cyclonic and windy conditions and poor air quality are observed under stable, anticyclonic and calm conditions.

The results from this study could be useful for air quality management at country level, providing a basis for a more comprehensive assessment of the relative impact of local weather and synoptic conditions on the air quality at regional level. In this sense, as it is based mainly in information at synoptic level, it can be used in the context of an operational early warning system for atmospheric effects on humans as a first evaluation tool for potentially dangerous conditions detection days in advance.