EXTREME SAHARAN DUST OUTBREAK IN MARCH 2022: IMPACT ON THE AIR QUALITY OF NW SPAIN

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The Iberian Peninsula, located relatively close to the Sahara desert, is a region prone to dust outbreaks, especially under specific meteorological conditions (Russo et al., 2020). In winter, dust outbreaks are scarce in this area, but in recent years they have occurred more often and with greater intensity (Oduber et al., 2019). In March 2022, one of these unusual events was recorded, impacting the NW of the Peninsula. This event was exceptional due to its intensity and geographical extension, registering record levels of PM_{10} in many locations (García-Valero, 2022).

This study aims to characterise the winter dust outbreak that affected the city of León (Spain) between 14 and 16 March 2022. A sampling campaign was conducted from 1 to 31 of March 2022 downtown, on the terrace of an official building. The sampling equipment included: i) a low-volume sampler with teflon filters (for the later analysis of trace elements), ii) a high-volume sampler equipped with quartz filters (for determining PM_{10}, water soluble ions and the carbon content); iii) an Optical Particle Counter and a Scanning Mobility Particle Sizer for the continuous monitoring of particle size distributions; iv) an Aethalometer *AE-33* for the continuous measurement of the aerosol-light absorption; v) a Total Carbon Analyser *TCA08* connected to the AE33 to provide near real time total, organic and elemental carbon measurements and vi) an integrating Nephelometer (*Aurora 3000*) for measuring the aerosol scattering and backscattering coefficients. Furthermore, the meteorological parameters were continuously recorded by a weather station. Air masses trajectories were also analysed using HYSPLIT model.

The preliminary results of this study show an increase in the concentrations of some air pollutants. The PM_{10} daily concentration reached 370 $\mu g/m^3$, largely exceeding the EU limit values set for the protection of human health. The OC daily concentration also increased, reaching 11 $\mu g/m^3$, presenting average values for the study period of 2.5 ± 1.1 $\mu g/m^3$. An important increase of the concentrations of crustal elements (Al, Mg, Ti, Si, Ca, K and Fe) was also observed.

[1] García-Valero, J.A., 2022. Informe acerca de la intrusión de polvo de origen sahariano sobre el territorio Peninsular Español entre los días 14 y 16 de Marzo de 2022 - Área de Técnicas y Aplicaciones de Predicción. AEMET.

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