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Summer variability of Saharan dust transport events in mountain areas north and south of Po basin

Tony C. Landi (1), Angela Marinoni (1), Paolo Cristofanelli (1), Davide Putero (1), Rocco Duchi (1), Marcello Alborghetti (2), Ubaldo Bonafè (1), Francescopiero Calzolari (1), Gian Pietro Verza (2), and Paolo Bonasoni (1)
(1) ISAC-CNR, Institute of Atmospheric Science and Climate, Bologna, Italy, (2) Ev-K2-CNR, Bergamo, Italy

Mineral dust intrusions from northern African desert regions have a strong impact on the Mediterranean areas and Italian peninsula as they can cause an anomalous increase of aerosol concentrations in the tropospheric column and often an increase of particulate matter at ground level. The estimate of Saharan dust contribution to aerosols concentrations is therefore a key issue in air quality assessment and policy formulation, since can cause air quality exceedances of the PM_{10} daily limits (50 μg m^{-3}) set by the European Union (EU/2008/50).
This study presents a first identification and characterization of Saharan dust outbreaks observed during summer season at two high mountain stations located both South (Mt. Cimone, 2165 m asl) and North (Rifugio Guasti, Stelvio National Park, 3285 m asl) of Po valley. An estimation of their impact on PM_{10} concentrations in both sites, and in urban and rural areas of the Po basin is provided. Joining specific measurements (ground and satellite based) and numerical modeling, an investigation into the vertical structure of dust load will be presented. Actually, methodologies conceived for distinguishing dust outbreaks transported above the boundary layer without any impact at the ground level from those causing deposition are currently still lacking.
Basically, the approach proposed in this work includes a deep analysis of *in-situ* measurements starting from long-term observation of Saharan dust carried out at the Mt. Cimone and more recent measurements performed in the framework of SHARE Stelvio Project, as well as the usage of *ad hoc* model chain (meteorological processor, chemical transport model, and aerosols optical properties calculation) to describe emission, transport and deposition dynamics of mineral dust that – in summertime - often affect the North Italy.