# Simultaneous advection of volcanic ash and desert dust in Naples Mediterranean aera

## S. Spinosa1, S. Amoruso1, M. Manzo1, L. Mereu2, A. Sannino1, S. Scollo2 and A. Boselli3

### 1Department of Physics “Ettore Pancini” University of Naples “Federico II”, I-80126 Napoli, Italy, 2Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Etneo, Piazza Roma 2, 95125 Catania, Italy, 3IMAA-CNR Istituto di Metodologie per l’Analisi Ambientale, I-85050, Tito Scalo-Potenza, Italy,

### salvatore.spinosa@unina.it

The volcanic aerosol plume following the paroxysmal event of Mount Etna on 2nd June 2025 was detected and characterized in the Mediterranean area of Naples city (Italy), together with transported Saharan dust, using remote sensing and satellite observations in combination with back-trajectory and dispersion model simulations.

Lidar profiles obtained using an Elastic/Raman system of the Naples National Facility of the ACTRIS Research Infrastructure were acquired from 3rd to 5th June 2025 and analysed together with aerosol column properties derived from sun-sky-lunar-photometers of the AERONET network.

Vertically resolved lidar data allowed clearly distinguishing the main atmospheric aerosol components by means of the spectral dependence of their optical properties, which permit a detailed aerosol characterization.

Satellite data of sulphur dioxide from Copernicus were used to track plume dispersion in the atmosphere from Mount Etna to Naples, in combination with HYSPLIT back-trajectories, confirming the transport of sulphur dioxide over the measurement area.

The obtained results demonstrate how the combination of a multi-parametric lidar with other instruments and techniques allows gaining a clear classification of the atmospheric aerosols, even for multilayered atmospheric conditions.

Moreover, the analysed case study highlights the complexity of the Mediterranean aerosol environment addressing the effectiveness of combining observational measurements and modelling.

**Keywords: Etna Activity, Remote Sensing, Long-Range Transport**