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Temporal evolution of volcanic ash plume in Romania, seen by lidars and EUMETCAST

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The multi-wavelength Raman lidar at INOE is used to observe significant variations in aerosol characteristics depending on the particle origins, based on the 3 elastic, 2 Raman, and depolarization channels. Starting April 17, the volcanic ash plume was visible above Bucharest. We identified 2 distinct episodes, conform to air masses trajectories. Between the 2 episodes, Romania was exposed for 2 days to air masses coming from South-West, leading to an increase of the humidity and washout of ash particles trapped in the lower atmosphere.
In order to forecast the arrival of the ash plume at our site, we used SEVRI data, which provides with good accuracy the direction of air masses. We used two infrared channels 3,9 μm during night and 10,8 μm during the day. Measuring the air mass velocity and directions we were able to estimate the exact hour when the plume will enter and will pass Romania, for both episodes. Moreover, we could identify and visualize the volcanic plume during daytime by using 4 channels: 3 in infrared (8,7;10,8;12;3.9 μm) and one in visible 0.6 μm, accordingly with EUMETSAT algorithm.
First episode was a pure ash intrusion at 3 and 5 Km altitude. Depolarizing particles are visible on the night of April 17, but the layers became more clearly defined on April 18. The second episode was produced by a change in air masses trajectories on April 21st. Although distinct depolarizing layers were identified by lidar at 4 and 6Km, the ash was dispersed over a large interval of altitudes and descending to PBL. As a general behaviour, each intrusion episode was followed by cloud formation at compact layers' altitude and rain. Particles trapped bellow clouds were rapidly transported to the ground by dry (during the night) or wet (during the day) deposition. This led to a significant increase of ground-level concentration and a modification of corresponding size distribution for April 19 and April 21st.