

7.14 VOLCANIC ASH FALLOUT AT MT.ETNA. SCENARIOS FROM A MESOSCALE WIND CIRCULATION.

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Mesoscale wind field at Mt.Etna volcano (Sicily, Italy) plays a fundamental role in both the cases of a gaseous plume and of an ash cloud. During the night, slope descendent breezes force the plume to follow the steep morphology. During the day, but also at night, particles, in their falling, encounter zones with strong sea/land breezes, catabatic/anabatic winds or inertial gravity currents. As a result, to evaluate plume dynamics, plume flux, ash dispersion, a mesoscale wind field reconstruction is necessary in a 3D environment, during all the hours of the day. Volcanic ash concentrations in the air are reconstructed by the flow model simulating the wind field over a digital terrain model of the volcano coupled with a Lagrangian particle model simulating ash dispersion. Particle settling velocities take account of ash dimension, density and air drag. Plume buoyancy is also considered. The numerical simulations performed in a specific, but typical summer day, characterized by a NW synoptic wind, show as particles, due to their settling velocities, can fall downwind the volcano, pushed by re-circulation mesoscale effects.