



Aerial monitoring in active mud volcano by UAV technique

Antonino Pisciotta, Giorgio Capasso, and Paolo Madonia

Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Palermo, Palermo, Italy (fabio.pisciotta@ingv.it)

UAV photogrammetry opens various new applications in the close range domain, combining aerial and terrestrial photogrammetry, but also introduces low-cost alternatives to the classical manned aerial photogrammetry. Between 2014 and 2015 three aerial surveys have been carried out. Using a quadrotor drone, equipped with a compact camera, it was possible to generate high resolution elevation models and orthoimages of The "Salinelle", an active mud volcano area, located in territory of Paternò (South Italy). The main risks are related to the damages produced by paroxysmal events. Mud volcanoes show different cyclic phases of activity, including catastrophic events and periods of relative quiescence characterized by moderate activity. Ejected materials often are a mud slurry of fine solids suspended in liquids which may include water and hydrocarbon fluids, the bulk of released gases are carbon dioxide, with some methane and nitrogen, usually pond-shaped of variable dimension (from centimeters to meters in diameter). The scope of the presented work is the performance evaluation of a UAV system that was built to rapidly and autonomously acquire mobile three-dimensional (3D) mapping data in a volcanic monitoring scenario.