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UAV systems volcano monitoring: first test on Stromboli on October 2004

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Aircrafts and helicopters are frequently used to monitor volcanic phenomena during crisis. Such missions are not only very expensive, but, depending from the environmental conditions, can be also highly dangerous for the crew. During the last Stromboli activity it was experienced two helicopter engine failures that forced to an emergency landing into the sea. In order to investigate new technologies which may be able to acquire information on hostile environments in safety for human personnel, the Aerospace Division of University of Bologna and INGV (National Institute for Geophysics Volcanology) started a research campaign aimed to demonstrate the feasibility of using UAV systems primarily for volcano monitoring.

An airplane, of about 3.5m of wingspan, 4 m long and maximum weight of 30 kg, with autonomous flight capability and a Ground Control Station for the mission planning and control, composes the proposed UAV system (named “Butterfly”). The airplane can carry different payload devices such as E/O and IR cameras, sensors to measure gas species, filters to capture particles and other sensors which allow to quantify the event and represent a guidance in planning the operation at ground or at sea.

A first test campaign over the Stromboli Island was carried out on October 2004 in order to demonstrate the feasibility of the project. The experience gained from the campaign pointed out some technical needs to improve e.g the landing system suggesting the use of a parachute and the GCS (Ground Control Station) to allow mission control from remote sites.