

New “Cost-effective Technologies”

- Forecasting
- Detection
- Characterization
- Extend use of existing data
- Build partnerships

Forecasting

- FUTUREVOLC, MED-SUV
- USGS-VDAP EFIS Workshop (October 2015)
 - Eruption Forecasting Information System
 - Warner Marzocchi, Roberto Tonini, Chris Newhall, Willy Aspinall
- New SAR Satellite (Low cost data)

Detection

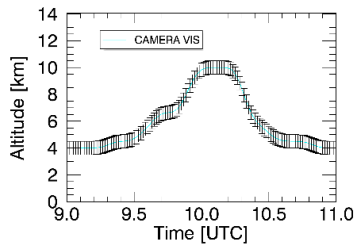
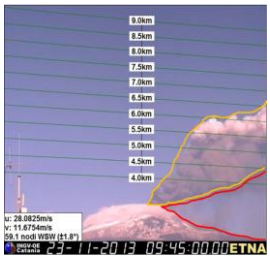
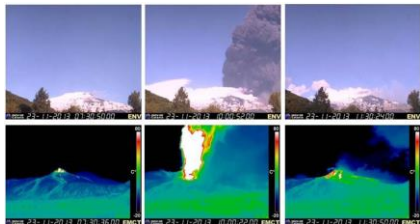
- Satellite-based
- GPS signal-to-noise
- Infrasound and ground-coupled airwaves
- Lightning
- Meteorological radars
- Cameras

- Partnerships are key!
 - Knowledge, resources, people, international cooperation!

Characterization

- What is needed?
 - Height
 - Vertical mass distribution
 - Particle size distribution
 - Eruption duration
 - Aggregation
- Radar
- Satellite
- Integration of data

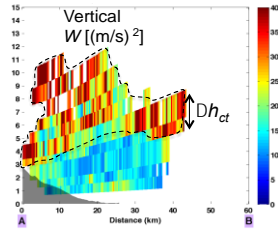
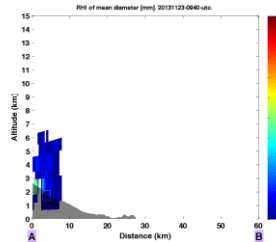
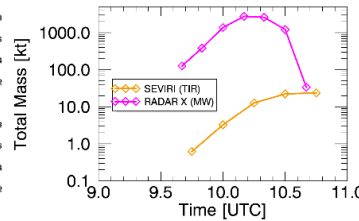
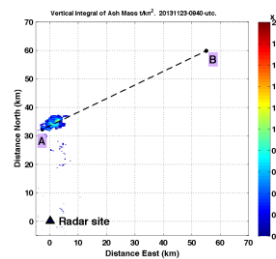
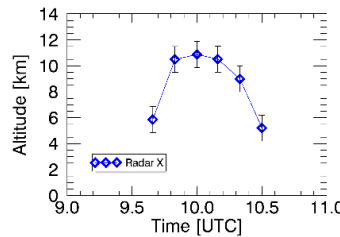
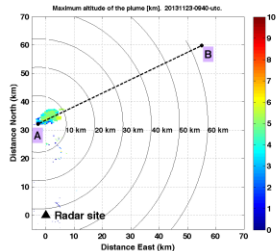
VIS and TIR Cameras



- ✓ Ash Altitude and Thickness

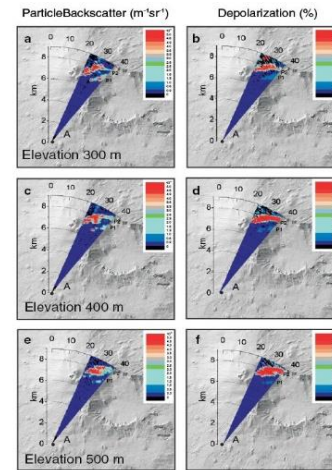
X band Radar

installed at Catania airport about 35 km south on Etna

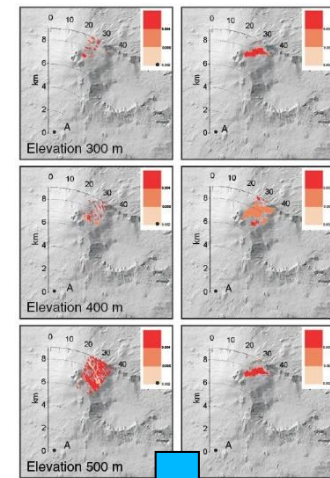


- ✓ Ash Mass, Concentration
- ✓ Particle Size Distribution parameters:
Particle mean diameter D_n [mm]
Number of particles N_n [n°/m3]
- ✓ Ash Altitude and Thickness

Lidar system



- ✓ Ash concentration
- ✓ Ash altitude and thickness



Sun-Photometer



- ✓ Ash Optical Properties

