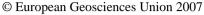
Geophysical Research Abstracts, Vol. 9, 09827, 2007

SRef-ID: 1607-7962/gra/EGU2007-A-09827





Recent deformation at Campi Flegrei Caldera (Italy) detected by DInSAR and levelling techniques

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The Campi Flegrei caldera, a volcanic and densely populated area located to the west of Napoli (Italy), was characterized by rapid ground deformation during 1970-72 and 1982-84, for a total amount of 3.5 m in the city of Pozzuoli. Since 1985 a slow deflation was active, with episodic microcrises of uplifts.

A new and consistent uplift event is now going on, beginning in November 2004, as revealed by spatial and terrestrial geodetic techniques.

In particular, we adopt almost all the available ENVISAT ASAR data acquired from both ascending and descending orbits during 2002-2006, to generate mean deformation velocity maps and time series with spatial resolution of about 100 m. The maps are computed following the Small BAseline Subset (SBAS) approach (Berardino et al., 2002), that implements an appropriate combination of differential interferograms generated from SAR data pairs (60 SAR images for this work).

In addition to satellite observations, we show data from the high precision levelling

network of the INGV-Osservatorio Vesuviano, consisting in about 320 benchmarks. Levelling measurements are regularly carried out on both the whole network and along the coast line; in case of a bradyseismic crisis, the temporal sampling is strongly increased.

Both DInSAR and levelling data evidence the maximum value of the vertical displacement near the city of Pozzuoli.

We model the observed deformation by means of 3D pressurized point-source and extended source, performing inversions to constrain their shape and location. The resulting sources are also compared with that inverted for the 1982-84 unrest.

References

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