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The unfruitful study of the Volcan de Colima (Jalisco – MEXICO) deformation by using ENVISAT and COSMO-SkyMed SAR time series: unexpected results

Christian Bignami and Carlo Alberto Brunori
Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy (christian.bignami@ingv.it)

The Colima volcanic complex is the most prominent volcanic centre of the western Mexican Volcanic Belt. Located in the State of Jalisco (Mexico), it consists of two southward-younging volcanoes, Nevado de Colima (the 4320 m high point of the complex) on the north and the 3850-m-high historically active Volcan de Colima (VdC) at the south. The VdC has had more than 30 periods of eruptions since 1585, including several significant eruptions in the late 1990s, and the scientific monitoring of the volcano began 20 years ago.
The 26 November 2014, the VdC, began its eruptive activity, which is still in progress. Dense clouds of smoke and ash were released into the atmosphere, as well as significant quantities of gas were emitted from the mouth of the volcano. In the following weeks repeated explosions produced plumes reached an altitude of about. The surrounding villages and towns were covered by volcanic ash. In particular, the largest city of Guzman, which has about 100.000 inhabitants, located 25 km North East of the volcano, was covered by ash. Any lava flows, pyroclastic flows or lahars can seriously invest in smaller towns (San Marcos, Tonilla and Queseria) located south of the volcanic cone. These towns were already hit by lava during the last intense crisis dating back to 2003-2005.
We have tried to make a systematic analysis of the available radar interferometric data to monitoring topographic changes with a few centimetres accuracy associated with VdC activity within the 2014-2015 period, for pre- syn- and post- eruptive phases. We have used data from the well-known ENVISAT and COSMO-SkyMed (CSK) satellite missions. In particular, CSK is the high-resolution four SAR satellites constellation of the ASI (Italian Space Agency); this mission has a great importance in the fields of prevention, mitigation and monitoring of geophysical risks. CSK is one of the most important SAR mission presently operating large dataset of X-band SAR images, with single and double polarization, with different configurations of acquisition. In addition, the CSK constellation makes it possible to overcome what, until its launch, it had been regarded as the most important limit on the use of SAR data for seismic and volcanic emergencies, i.e. the revisit time.
However, an unexpected result has been figure out the ongoing subsidence in the Ciudad Guzman near the studied volcano.