Monitoring of the 2018 Kilaeua, Hawaii, volcanic crisis using high-rate GNSS potition time series

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Abstract

Since 1983, the Kilaeua volcano, Hawaii, experiences a continuous eruption. But, from late April 2018, its activity has intensified causing several damages in the surrounding areas. It has started with the collapse of the Pu‘u‘Ō‘ō crater, followed by a seismic crisis which includes a large earthquake (Mw 6.9) that occurred on May 4th. Thanks to the GNSS data set acquired by the USGS and publicly available at UNAVCO, we process the data using a state-of-the-art kinematic processing method. We obtain 3-components high-rate (30-sec.) positions time series from April 21 to May 13 for 21 stations that are located less than 50km from the Mw6.9 earthquake. These time series show the complete deformation pattern over this time period, which includes the crater collapse, the volcanic eruption, the coseismic offset of the large earthquake along with its postseismic signal. So far we have compared the coseismic offsets with a rupture model obtained from strong motion data. We welcome any suggestions to further analyze this volcanic crisis using this high-resolution dataset.

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