



Detection of a Precursory Phase of the 2018 Magma Eruption in the Lower East Rift Zone of Kilauea Volcano, Hawaii

Kuan-Fu Feng (1,2), Hsin-Hua Huang (2), Yih-Min Wu (1,2,3)

(1) Department of Geosciences, National Taiwan University, Taipei, Taiwan, (2) Academia Sinica, Institute of Earth Sciences, Taipei, Taiwan, (3) NTU Research Center for Future Earth, National Taiwan University, Taipei, Taiwan

A sequence of eruptions of the Kilauea volcano, Hawaii commenced in early May 2018 and caused serious damage and residential evacuation. To understand the magma intrusion process, which produces little measurable effect at the surface prior to the eruption, we use seismic noise interferometry and ~ 1.5 -year vertical-component seismic data from 6 broadband seismometers to investigate temporal seismic velocity changes (dv/v) at depth near Kilauea. Analyses of three different frequency bands (0.3-0.6 Hz, 0.6-0.9 Hz, and 0.9-2.0 Hz) show distinct earthquake-related and magma-related structural changes in the uppermost 500 m and below 1 km from the surface. The magma-related dv/v began in December 2017 and exhibit a dichotomous pattern of seismic velocity that increases to the southwest and slightly decreases to the northeast of the East Rift Zone, revealing an intrusive magma process with a long precursory phase beginning almost a half year before the May 2018 eruption.