



Aseismic block movement of southern flank of Kilauea revealed by wavelet analysis of InSAR and GPS time series

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The Hilina Fault System (HFS) is located on the southern flank of Kilauea volcano. It is thought to be active during coseismic events (e.g. 1976 Kalapana event) and thus to represent the surface expression of an unstable edifice sector. Despite its structural and kinematic importance for landslide initiation processes, the fault activity has not been detected by means of modern space geodetic data.

In this study we present surface deformation data obtained by InSAR and GPS time series between 2003 and 2010 over the HFS. To detect hidden signals in the deformation data, we analyze the InSAR and GPS data by using a wavelet based decomposition technique. This combined analysis allows ruling out the influence of local atmospheric turbulences, by identifying the affected signal components. The result moreover reveals that the frequency content of the deformation time series varies spatially over the HFS. This variability suggests movements of structural blocks that are bounded by the segments of the HFS. Since no significant seismicity is observed over the study period, we conjecture that this block-wise movement occurred aseismically.