Magmatic sill intrusions beneath El Hierro Island following the 2011-2012 submarine eruption

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El Hierro, the most southwestern island of Canary Islands, Spain, is a volcano rising from around 3600 m above the ocean floor and up to of 1500 m above sea level. A submarine eruption occurred off the coast of El Hierro in 2011-2012, which was the only confirmed eruption in the last $\sim$ 600 years. Activity continued after the end of the eruption with six magmatic intrusions occurring between 2012-2014. Each of these intrusions was characterized by hundreds of earthquakes and 3-19 centimeters of observed ground deformation. Ground displacements at ten continuous GPS sites were initially inverted to determine the optimal source parameters (location, geometry, volume/pressure change) that best define these intrusions from a geodetic point of view. Each intrusive period appears to be associated with the formation of a separate sill, with inferred volumes between 0.02 - 0.3 km3. SAR images from the Canadian RADARSAT-2 satellite and the Italian Space Agency COSMO-SkyMed constellation have been used to produce high-resolution detailed maps of line-of-sight displacements for each of these intrusions. These data have been combined with the continuous GPS observations and a joint inversion undertaken to gain further constraints on the optimal source parameters for each of these separate intrusive events. The recorded activity helps to understand how an oceanic intraplate volcanic island grows through repeated sill intrusions; well documented by seismic, GPS and InSAR observations in the case of the El Hierro activity.