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Inside the volcano: mapping the convoluted path of magma ascent in Eyjafjallajökull volcano with GPS and InSAR

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The Eyjafjallajökull volcano has been exhibiting intermittent unrest for the past 18 years. The most recent intrusive episode was in 1999. The current activity initiated in January 2010 with intense seismic activity and inflation observed by continuous GPS stations. The rate of deformation rapidly increased in early March until a basaltic flank eruption started on Fimmvörðuháls on 20 March. The eruption continued until 12 April without much observed deflation. Two days later, a second more exposive eruption started at the ice covered summit of Eyjafjallajökull. Very fine ash was produced during a phreatomagmatic eruption phase, where magma of trachy-andesitic composition came into direct contact with glacial melt water, causing unprecedented disruption to air traffic in Europe. During the first week of the second eruption, the geodetic data show motion cosistent with a volume decrease in a magma chamber at $\sim$4 km depth under the summit caldera.
The three previous historical eruptions of Eyjafjallajökull in 920, 1612 and 1821–1823 were followed by subsequent eruptions of Katla. The geodetic observations, however, do not detect any measurable deformation at Katla through April 2010.