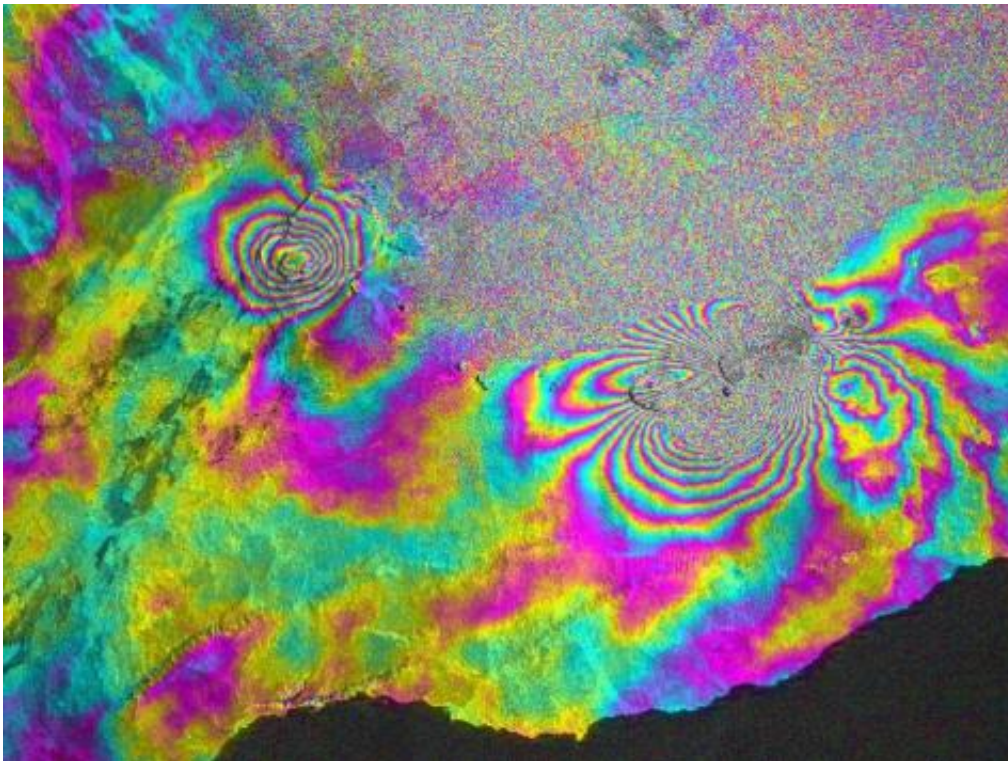


NASA airborne radar set to image Hawaiian volcanoes

April 4 2011



On March 5, 2011, a large fissure eruption began on the east rift zone of Hawaii's Kilauea volcano. Credit: ASI/NASA/JPL-Caltech

(PhysOrg.com) -- The Kilauea volcano that recently erupted on the Big Island of Hawaii will be the target for a NASA study to help scientists better understand processes occurring under Earth's surface.

A NASA Gulfstream-III aircraft equipped with a [synthetic aperture radar](#) developed by NASA's Jet Propulsion Laboratory in Pasadena, Calif., is scheduled to depart Sunday, April 3, from the Dryden Aircraft Operations Facility in Palmdale, Calif., to the Big Island for a nine-day mission.

The Uninhabited Aerial Vehicle Synthetic Aperture Radar, or UAVSAR, uses a technique called interferometric synthetic aperture radar that sends pulses of microwave energy from the aircraft to the ground to detect and measure very subtle deformations in Earth's surface, such as those caused by earthquakes, volcanoes, landslides and glacier movements.

As the Gulfstream-III flies at an altitude of about 12,500 meters (41,000 feet), the radar, located in a pod under the aircraft's belly, will collect data over Kilauea. The UAVSAR's first data acquisitions over this volcanic region took place in January 2010, when the radar flew over the [volcano](#) daily for a week. The UAVSAR detected deflation of Kilauea's caldera over one day, part of a series of deflation-inflation events observed at Kilauea as magma is pumped into the volcano's east rift zone.

This month's flights will repeat the 2010 flight paths to an accuracy of within 5 meters, or about 16.5 feet, assisted by a Platform Precision Autopilot designed by engineers at NASA's Dryden Flight Research Center on Edwards Air Force Base, Calif. By comparing these camera-like images, interferograms are formed that reveal changes in Earth's surface.

Between March 5 and 11, 2011, a spectacular fissure eruption occurred along the east rift zone. Satellite radar imagery captured the progression of this volcanic event.

"The April 2011 UAVSAR flights will capture the March 2011 fissure eruption surface displacements at high resolution and from multiple viewing directions, giving us an improved resolution of the magma injected into the east rift zone that caused the eruption," said JPL research scientist Paul Lundgren.

This injection of magma takes the form of a dike, a thin blade-like sheet of magma extending from the surface to several kilometers depth, with an opening of only a few meters.

"Our goal is to be able to deploy the UAVSAR on short notice to better understand and aid in responding to hazards from Kilauea and other volcanoes in the Pacific region covered by this study," Lundgren added.

More information: uavsar.jpl.nasa.gov/

Provided by JPL/NASA

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