Infrasonic Monitoring Network on the Big Island of Hawaii

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The USGS Hawaiian Volcano Observatory (HVO) with the participation of the University of Hawaii Infrasound Lab (ISLA) installed three new permanent infrasound arrays on the south half of the Island of Hawaii. Together with three existing permanent arrays maintained by ISLA, the current infrasound network around Kīlauea and Mauna Loa volcanoes is one of the most advanced of any volcano in the world. Open-vent volcanoes such as Kīlauea are particularly good infrasound emitters as lava spattering and unsteady gas release is common. The network was designed with two main goals in mind: 1) to monitor and study the infrasound sources associated with the ongoing Pu'u 'Ō'ō and Halema'u'mau eruption, and 2) to detect in near real-time new eruptions at Mauna Loa or Kīlauea volcanoes. Each HVO array consists of 4 sensors, which form an equilateral triangle ∼100 m on a side surrounding a central sensor. Three other permanent arrays maintained by ISLA (I59US, MENE, KHLU) have been operational since 2000, 2006, and 2009, respectively, and consist of a combination of Chaparral 25 and 50 sensors. Each infrasound instrument within the HVO arrays is built around an low-cost AllSensor MEMS sensor, which has higher noise characteristics than a Chaparral 25, but similar frequency response. ISLA also operates stations on Maui and Kauai that provide –statewide coverage. Since the full network has been established, we have recorded several infrasound signals including infrasonic tremor from Halema'uma'u, collapses from the craters of Halema'uma'u and Pu'u 'Ō'ō, and other natural and anthropogenic infrasound from diverse sources on-island, offshore, and aloft. Future developments will include real-time detection, location, and identification of infrasonic signals for eruption notification. We hope to increase public awareness of volcanic infrasound by posting real-time locations on an interactive display, similar to how seismicity is currently reported. MENE data is presently available, and the HVO infrasound data should be available for research projects through the IRIS Data Management Center beginning in March 2013.