

2006 Fall Meeting
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Cite abstracts as **Author(s) (2006), Title, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract xxxxx-xx**

Your query was:
au=laske

HR: 1340h

AN: **V13B-0657**

TI: [The Hawaiian PLUME Project Successfully Completes its First Deployment](#)

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AB: The Hawaiian PLUME (Plume-Lithosphere Undersea Melt Experiment) project is a multi-disciplinary program to study the deep mantle roots of the Hawaiian hotspot. The nearly linear alignment of the Hawaiian Islands has heretofore prevented high-resolution, three-dimensional imaging of mantle structure in the region from land seismic observations, a situation that has permitted debates to persist over whether or not the Hawaiian hotspot is underlain by a classical plume from the deep mantle and how mantle upwelling interacts with the overlying lithosphere beneath the Hawaiian Swell. The centerpiece of the PLUME project is a large broadband seismic network that includes ocean-bottom seismometers (OBSs) as well as portable land stations. Occupying a total of more than 80 sites and having a two-dimensional aperture of more than 1000~km, this network includes one of the first large-scale, long-term deployments of broadband OBSs. The seismic experiment has been conducted in two stages to record teleseismic body and surface waves over a total duration of two years. A first deployment of 35 OBSs extended from January 2005 through January 2006 and was centered on the island of Hawaii, the locus of the hotspot. A second OBS deployment, with a larger aperture and larger station spacing was carried out in May 2006 to collect data for another year. The first deployment was a technical success, with 32 of 35 OBSs recovered and many large events at suitable distances and azimuths well recorded. We recorded 225 events with scalar seismic moments greater than 5×10^{17} Nm. Our database includes the great 28 March 2005, $M_S=8.2$ aftershock of the 26 December 2004 Sumatra-Andaman earthquake and two large earthquakes on the Juan de Fuca plate on 15 and 17 June 2005. Our surface wave analysis will be based on 102 large, shallow ($h_0 < 200$ km) earthquakes with scalar seismic moments $M_0 \geq 20 \times 10^{17}$ Nm. This number of events is about 20% more than what was gathered during the year-long SWELL pilot deployment in the same region in 1997-98 using solely differential pressure gauges. The database also includes excellent long-period body wave waveforms suitable for tomographic imaging as well as horizontal- component data suitable for a shear-wave splitting analysis and for identifying converted phases from the upper-mantle transition zone with receiver function techniques. In addition to the seismic experiment, nine of eleven dredges on the first deployment cruise yielded coral and basalt samples that will help to constrain subsidence rates of the Hawaiian Islands and the origin of rift volcanism. On the two deployment cruises we also obtained high-resolution multi-beam bathymetry along previously unmapped transects covering areas of the eastern parts of the Maui and the Molokai Fracture Zones as well as portions of the Bach Ridge at the southern end of the Musician Seamounts.

UR: <http://mahi.ucsd.edu/Gabi/plume.html>

DE: 3037 Oceanic hotspots and intraplate volcanism

DE: 3094 Instruments and techniques

DE: 7270 Tomography (6982, 8180)

DE: 8124 Earth's interior: composition and state (1212, 7207, 7208, 8105)

DE: 8415 Intra-plate processes (1033, 3615)

SC: Volcanology, Geochemistry, Petrology [V]

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