

## **2009 SIO OBSIP Field Programs Funded through OCE**

Wiens et al. – Lau Basin; 59 short-period OBS (39 LC4x4 OBS – 20 WHOI D2), 77 total active-source deployments (51 SIO); R/V Langseth:

Proposal title: "Collaborative Research: Crustal Accretion and Mantle Processes Along the Subduction-Influenced Eastern Lau Spreading Center ." This cruise is the active-source component of a combined active/passive seismic experiment along the Eastern Lau Spreading Center to test the following hypotheses. 1. Circulation in the mantle wedge is dominated by slab driven flow. 2. Interaction of the arc and backarc magma production controls the character of the ridge by influencing melt flux, petrology, and geochemistry. 3. Variations in the mantle melt supply control ridge crest features such as morphology, thermal structure, and hydrothermal venting.

Langseth ship schedules and BBOBS instrument availability initiated a decision by NSF to split the passive and active facets of this project. The active source experiment initially called for 100 ocean bottom seismographs deployed along a 250 km section of the spreading center extending from the inflated Valu Fa region to the magma-starved northern Eastern Lau Spreading Center where the axial melt lens is absent. The passive experiment consists of 55 broadband ocean bottom seismographs and five land seismographs deployed for 10 months to image the larger-scale structure of the melt production region and the mantle flow pattern. The passive component was deployed in Fall 2009 using WHOI and LDEO Long-Period OBS units.

The revised project plan called for 77 OBS deployments on a 44-day cruise aboard the *R/V Langseth*, taking place from January 24<sup>th</sup> – March 8<sup>th</sup> with port calls from Nuku'alofa, Tonga to Suva, Fiji. The operation required the combined efforts of the SIO and WHOI OBSIP groups. During the cruise leg two groups managed to deploy and recover 59 instruments, 21 from WHOI and 38 from SIO. With the help from the experienced crewmembers onboard the Langseth both OBSIP groups recovered 100% of their instruments and were able to fill in a 150Km grid along the ELSC with a total of 84 deployments and 84 recoveries including the 25 relocated mid cruise (exceeding projected deployment numbers). A summary of SIO instrument deployments is included below.

Site	serial no.	Lat	Ln	deploy time	synch time	wake time	recovery time	drift(s)
<b>Weins 2009 (4 channel 200 Hz)</b>								
5	47	-20.675483	-175.98715	2009:025:01:39:00	2009:025:01:15:00	2009:025:08:00:00	2009:056:04:52:00	-0.01963
6	60	-20.613149	-175.96233	2009:025:02:36:50	2009:025:01:54:00	2009:025:07:00:00	2009:056:03:27:00	0.005288
7	58	-20.5269	-175.95531	2009:025:03:26:50	2009:025:02:49:00	2009:025:08:00:00	2009:056:01:49:00	0.048822
8	57	-20.452783	-175.93908	2009:025:04:17:00	2009:025:03:37:00	2009:025:09:00:00	2009:056:23:00:00	0.047034
9	95	-20.401099	-176.00658	2009:025:05:11:00	2009:025:04:46:00	2009:025:10:00:00	2009:057:08:33:00	0.048463
10	17	-20.426466	-176.07893	2009:025:06:05:10	2009:025:05:38:00	2009:025:10:00:00	2009:058:11:47:00	0.126213
11	10	-20.474849	-176.02346	2009:025:06:52:00	2009:025:06:26:00	2009:025:12:00:00	2009:057:10:01:00	0.078128
12	75	-20.501566	-176.08673	2009:025:07:45:00	2009:025:07:14:00	2009:025:13:00:00	2009:058:13:38:00	0.254039
13	136	-20.549466	-176.03818	2009:025:08:31:00	2009:025:08:19:00	2009:025:14:00:00	2009:057:11:31:00	-0.031726
14	2	-20.57555	-176.10331	2009:025:09:28:00	2009:025:09:02:00	2009:025:16:00:00	2009:058:15:21:00	-0.0957147
15	78	-20.623366	-176.05462	2009:025:10:15:00	2009:025:09:47:00	2009:025:17:00:00	2009:057:13:05:00	-0.0142321
16	93	-20.650033	-176.12005	2009:025:11:07:00	2009:025:10:13:00	2009:025:18:00:00	2009:057:14:39:00	-0.0473649
23	83	-20.919616	-176.11735	2009:024:20:46:10	2009:024:19:52:00	2009:025:00:00:00	2009:042:05:50:00	0.1233726
24	140	-20.942833	-176.19863	2009:024:19:33:00	2009:024:17:20:00	2009:024:22:00:00	2009:042:04:16:30	0.053211
31	7	-20.7065	-176.22846	2009:025:23:55:00	2009:025:23:03:00	2009:026:04:00:00	2009:041:19:55:18	0.0002603
32	94	-20.677699	-176.17442	2009:026:00:37:00	2009:025:23:17:00	2009:026:05:00:00	2009:056:07:55:00	0.050961
33	1	-20.63785	-176.16977	2009:026:01:13:00	2009:025:23:52:00	2009:026:06:00:00	2009:057:16:03:00	-0.013444
34	92	-20.631933	-176.21323	2009:026:01:52:00	2009:026:00:27:00	2009:026:07:00:00	2009:057:17:28:00	0.0457237
35	89	-20.603817	-176.15813	2009:026:02:36:00	2009:026:01:02:00	2009:026:08:00:00	2009:058:16:46:00	0.0926229
36	90	-20.5664	-176.15065	2009:026:03:13:00	2009:026:02:14:00	2009:026:09:00:00	2009:058:19:06:00	0.155866
37	32	-20.557667	-176.19745	2009:026:03:58:00	2009:026:02:36:00	2009:026:09:00:00	2009:058:19:21:00	0.3051725
38	21	-20.529767	-176.14185	2009:026:05:07:00	2009:026:03:07:00	2009:026:10:00:00	2009:058:20:41:00	0.0280719
39	55	-20.484117	-176.17888	2009:026:05:52:00	2009:026:03:40:00	2009:026:11:00:00	2009:058:22:08:00	-0.0028897
40	139	-20.446567	-176.17337	2009:026:06:40:00	2009:026:05:03:00	2009:026:11:00:00	2009:058:23:35:00	0.084978
41	137	-20.455883	-176.12755	2009:026:07:35:00	2009:026:05:40:00	2009:026:12:00:00	2009:059:00:45:00	-0.078735
42	27	-20.41	-176.16467	2009:026:08:32:00	2009:026:06:43:00	2009:026:13:00:00	2009:059:02:06:00	0.009402
43	77	-20.381433	-176.11043	2009:026:09:14:00	2009:026:07:23:00	2009:026:13:00:00	2009:059:03:33:00	0.00711
44	141	-20.360917	-176.21615	2009:026:10:18:00	2009:026:08:19:00	2009:026:14:00:00	2009:057:23:46:00	0.02676
45	138	-20.435767	-176.22962	2009:026:11:06:00	2009:026:09:33:00	2009:026:18:00:00	2009:057:22:13:00	0.191211
51	87	-20.88045	-176.325	2009:026:16:36:30	2009:026:15:40:00	2009:026:20:00:00	2009:041:09:26:00	0.005374
52	88	-20.9028	-176.40998	2009:026:17:27:30	2009:026:16:46:00	2009:026:21:00:00	2009:041:07:55:00	0.059214
53	86	-20.82895	-176.39287	2009:026:18:31:10	2009:026:17:37:00	2009:026:22:00:00	2009:041:06:27:00	0.048124
54	56	-20.755067	-176.37753	2009:026:19:49:10	2009:026:18:54:00	2009:026:23:00:00	2009:041:03:21:00	0.0655019
55	85	-20.6808	-176.36167	2009:026:20:44:30	2009:026:20:03:00	2009:027:00:00:00	2009:041:23:57:20	0.0119262
56	38	-20.606783	-176.34537	2009:026:21:35:10	2009:026:21:00:00	2009:027:01:00:00	2009:056:10:48:00	0.004853
57	61	-20.528633	-176.32898	2009:026:23:15:30	2009:026:22:14:00	2009:027:02:00:00	2009:056:12:17:00	-0.1517335
58	13	-20.4538	-176.31198	2009:027:00:23:30	2009:026:23:41:00	2009:027:04:00:00	2009:056:13:48:00	0.0866899
59	19	-20.384083	-176.2973	2009:027:01:14:20	2009:027:00:05:00	2009:027:06:00:00	2009:056:15:42:00	-0.0262647
66	3	-20.2651	-176.22547	2009:043:01:11:10	2009:043:00:29:00	2009:043:04:00:00	2009:058:01:07:00	0.112209
67	87	-20.33105	-176.16733	2009:043:01:51:20	2009:043:01:02:00	2009:043:05:00:00	2009:059:04:56:00	0.008536
68	140	-20.301917	-176.12193	2009:043:02:23:40	2009:043:01:37:00	2009:043:06:00:00	2009:059:06:20:00	0.05407
69	7	-20.256233	-176.16062	2009:043:02:39:00	2009:043:02:03:00	2009:043:07:00:00	2009:059:07:38:00	-0.007726
70	88	-20.2279	-176.10583	2009:043:03:34:40	2009:043:02:24:00	2009:043:08:00:00	2009:058:05:50:00	0.063858
71	56	-20.182217	-176.14452	2009:043:04:08:30	2009:043:03:02:00	2009:043:09:00:00	2009:058:04:18:00	0.072754
72	86	-20.107583	-176.12833	2009:043:05:09:20	2009:043:03:20:00	2009:043:10:00:00	2009:057:00:16:00	0.04329
73	85	-20.153717	-176.08885	2009:043:05:46:40	2009:043:04:08:00	2009:043:11:00:00	2009:057:01:37:00	0.009391