

BBOBS observation in French Polynesia

Daisuke Suetsugu[1]; Hajime Shiobara[2]; Hiroko Sugioka[3]; Toshihiko Kanazawa[4]; Yoshio Fukao[5]

[1] IFREE; [2] OHRC, ERI, Univ. Tokyo; [3] JAMSTEC; [4] ERI, Tokyo Univ; [5] Earthq. Res. Inst., Univ. of Tokyo
IFREE/JAMSTEC

1. Introduction

The South Pacific region, French Polynesia and its surrounding regions, is characterized by numerous anomalies, e.g., broad and positive bathymetric anomalies; hot spot volcanisms and their various geochemical signatures; slow seismic velocities in the mantle. This anomalous region has been referred to as South Pacific Superswell and there have been controversies on the origin. Long wavelength seismic tomography has showed the South Pacific region and Africa may be the site of large scale mantle upwelling from the core-mantle boundary. To improve the resolution, we have deployed broadband ocean bottom seismographs (Kanazawa et al., 2001; called BBOBS, hereafter) in the French Polynesian region since 2003. The Polynesia BBOBS project is conducted by cooperation with French institutions. The French group has operated three permanent broadband stations and ten temporary broadband stations (2001-2005) on oceanic islands of French Polynesia (Barruol et al., 2002). The Japanese BBOBS and French land-based data are complementary to each other and we plan to exchange the data to have better resolution.

2. Installation and recovery of BBOBS

The BBOBS locations are shown in Fig. 1. The locations were selected so as to form a uniform coverage by BBOBS stations and French broadband seismic stations on oceanic islands. The eight BBOBS were installed in January, 2003, by the YK02-10 cruise with R/V YOKOSUKA. The recording length was set to be one year after the installation.

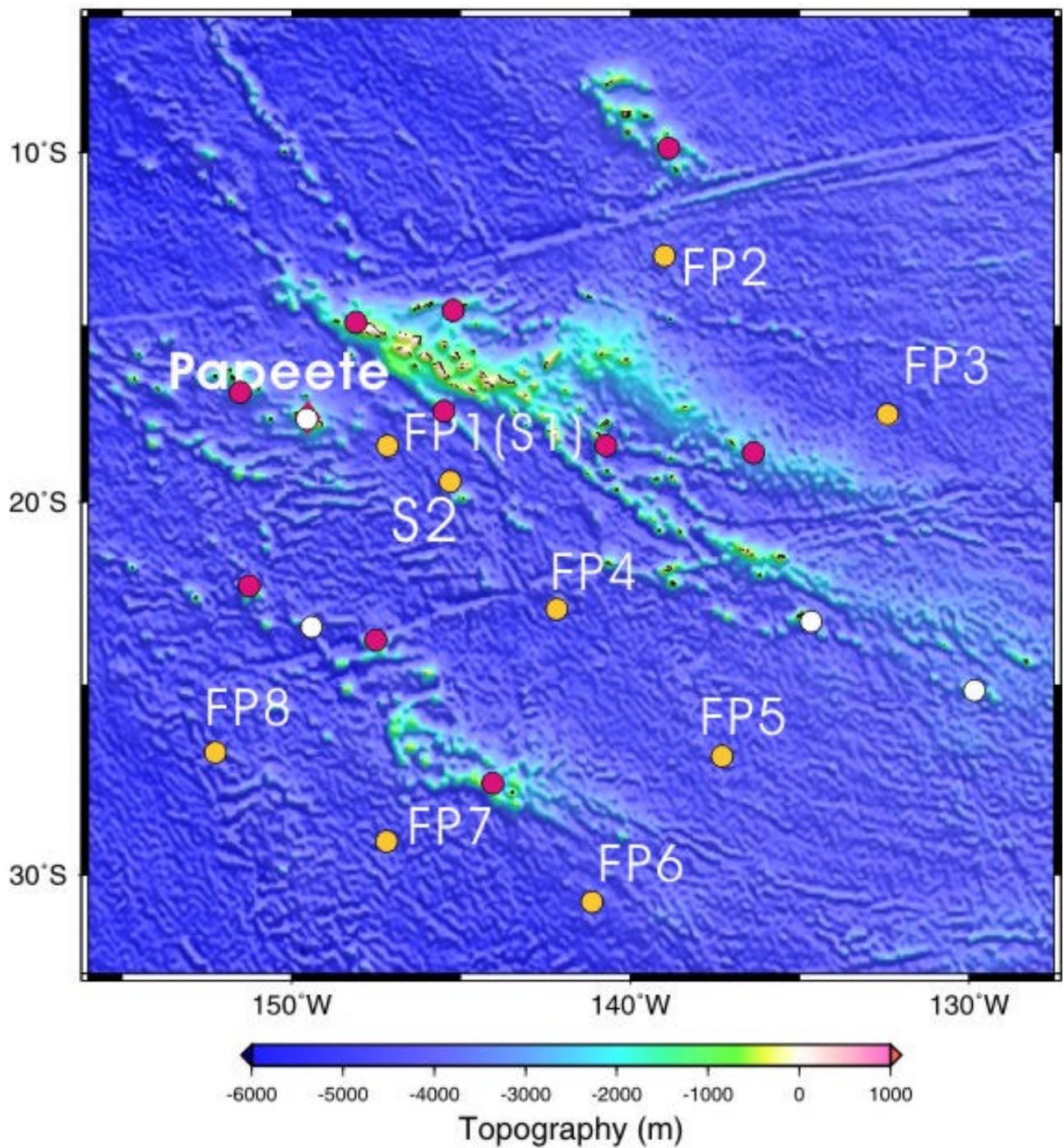
We conducted the recovery operation in the YK04-08 cruise with R/V YOKOSUKA on August-September, 2004. We planned to recover BBOBS from 8 sites by sending a release command from YOKOSUKA with a transponder. However, we could recover successfully only at three sites (FP2, 7, 8) and not at five sites (FP1, 3, 4, 5, 6). Two BBOBS (S1 and S2) were installed in the YK04-08 cruise near the Society hot spot to obtain detailed image of plumes beneath the hot spot. They will be recovered in May, 2005.

To recover the five BBOBS left on the seafloor, the YK04-09-2 cruise of R/V YOKOSUKA with the manned submersible SHINKAI-6500 was conducted in November, 2004, in which all the BBOBS were successfully recovered by dives of the submersible. The dives enabled us to see how the BBOBS is installed on the seafloor, showing the BBOBS were not stuck in the surface mud and leveled on the seafloor. The visual inspection from the submersible suggests that the electric corrosion started by the release command but stopped before the anchors were released.

3. Ambient noise on the sea floor

To measure the performance of a seismic station, there is the noise model calculated from records of randomly selected time windows without known earthquakes (IRIS, 1994). The common characteristic of these noise models compared with another obtained in the northwest Pacific is lower noise level in the micro-seismic band (1-10s) which shows nearly below the high noise model defined by IRIS. Another characteristic is strong peaks in horizontal spectra in higher frequency (1-2Hz) seen at FP2 and FP4 (also at FP3) but not in other sites nor previously studied several areas. This feature may be speculated as due to continuous magmatic activities.

BBOBS locations



- BBOBS(JAPAN-FRANCE)
- PLUME(FRANCE)
- Permanent station(LDG,IRIS)