

Broadband seismometer for a long-term observation on the sea floor

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For the construction of seismic network in the ocean, which plays an important role for the Ocean Hemisphere network Project, we have developed and started the observation by using a broadband ocean bottom seismometer (BBOBS) for long-term and mobile observation. This BBOBS interpolates the network of ocean floor borehole observatories and is possible to make a dense array, which is based on our reliable ocean bottom seismometer developed more than several years. This type was deployed twice in the northwestern Pacific Basin and obtained the data of about 12 months in the total.

For the construction of seismic network in the ocean, which plays an important role for the Ocean Hemisphere network Project, we have developed and started the observation by using a broadband ocean bottom seismometer (BBOBS) for long-term and mobile observation.

This BBOBS is designed to interpolate the network of the ocean floor borehole observatories and to make a dense array. The development is based on our reliable ocean bottom seismometer with a short period sensor, which has been developed more than several years. As this BBOBS is a self pop-up type, it is deployed by free falling from the sea surface to the sea floor, and comes up to the surface by its buoyancy after releasing the anchor. So that it does not need ROVs or special equipments. The broadband sensor used is the CMG-1T (Guralp, UK) with the pass band of 360s-50Hz. It is installed on the automatic leveling mechanism, and the signal output is digitized (20bit, 128Hz) and continuously recorded on the hard disks (four 2.5inch 6GB SCSI). About 50 lithium cells (DD size) are used for one year observation. All these units are housed in a titanium sphere (D=65cm) which has about 70kg buoyancy and can be deployed up to 6000m depth. Before the deployment, the total weight becomes about 250kg in the air.

This type was deployed twice in the northwestern Pacific Basin and obtained the data of about 12 months in the total. The spectra show low vertical noise and large periodical change in horizontal noise, and the frequency band between 10s-100s looks a good window for the OBS data.