

## Broad band seismic observation in the ocean

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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 two types of broad band seismic observation system on the sea floor. One type is an ocean floor borehole seismic observatory which is ideal to reduce the noise from the sea surface deviation. Four of this type are already installed at, off Sanriku, northwestern Pacific Basin and West Philippine Sea Basin. Another type is designed for mobile broad band observation to interpolate the above type and to make a dense array, which is based on our reliable ocean bottom seismometer. This type was deployed twice in the northwestern Pacific Basin and obtained the data of about 12 months in the total.

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One type is an ocean floor borehole seismic observatory which is ideal to reduce the noise from the sea surface deviation. Four of this type are already installed at, off Sanriku (JT-1,2), northwestern Pacific Basin (WP-2) and West Philippine Sea Basin (WP-1). From short time and preliminary data obtained from JT-1 and WP-2, it becomes clear that this ocean floor borehole seismic observatory has less background noise and is good for the seismic observation as expected.

Another type is designed for a mobile broad band observation to interpolate the network by the above type and to make a dense array. The development is based on our reliable ocean bottom seismometer (OBS) with a short period sensor, which has been developed more than several years. As this broad band OBS 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. 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.