

Broadband seismic observation by simplified installation at coral reef island

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Generally, broadband seismic observation on small island in the ocean is severe for fine measurement. For stable measurement, borehole system is adopted, which is very high cost. We try simple and low cost installation of broadband seismic sensor in coral reef island in Pacific region.

We operate Majuro station, Marshall Island, for OHP geomagnetic observation. We install broadband seismometer to upgrade to integrated station. Majuro is very simple atoll, so that we construct semi-underground shaped hole down to 1.5m depth hard layer. Double water proof concrete walls have built to protect sea water. And for protection of sunshine and increasing temperature, roof and inner lid are covered on sensor table.

We use STS-2 seismic sensor and Q330 for data logger. We use off-line recording system with multiple equipments including backup system. The recovery is performed monthly by cooperator.

Temperature condition is stable, which means annual and daily variations are small. The mass position of sensor stays in stable range. Even coral reef, subsurface basement layer is very stiff, so that local tilting is small amount. Overall operation seems that stable broadband seismic observation is achieved.

Due to isolated island, oceanic wave and tide shake this station. The seismic record is sufficient quality for general earth's structure analysis as result of evaluation of spectrum analysis and event data archive. Remarkably T-phases originated at Solomon and Papua New Guinea seismic events are frequently recorded. And semi-monthly and annual variations of noise characteristics are found. They may be related with oceanic tide and ocean flow status.