Geophysical Research Abstracts, Vol. 8, 05800, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05800

Seismometer Installation Device in GEOSTAR-type Seafloor Observatories and Validation through Data Quality Analysis

S. Monna (1), C. Montuori (1), L. Beranzoli (1), P. Favali (1,3), F. Frugoni (1), F. Gasparoni (2), G. Marinaro (1),

(1) Istituto Nazionale di Geofisica e Vulcanologia, Roma, Italy, (2) Tecnomare-ENI Spa, Venezia, Italy, (3) Università di Roma "La Sapienza", Roma, Italy, (paolofa@ingv.it / Phone: +39-06-51860428)

Correct installation of geophysical sensors to obtain high quality long time data series, has become one of the main issues in the development of multiparameter observatories. In particular, correct deployment of three component broadband seismometers on deep seafloor depends on several factors which can heavily influence data quality. Some factors are directly related to the installation procedure itself, as good sensor-ground coupling, accurate knowledge of sensor component orientation, or stable time reference. Other factors are external, as for example the effect of sea water flowing around the sensor, but their effect on data quality also depends on the type of installation and experimental design.

Design studies to improve seismic sensor installation have been performed for the GEOSTAR type observatory. The major requirements for the design was efficient ground coupling and the possibility to control sensor deployment from the sea surface using a very simple type of ROV.

Design studies included different versions of seismometer housing and led to a novel installation procedure which was later validated by analysis of data acquired during the seafloor missions of GEOSTAR type observatories.

The evolution of the design and performance for the different seismometer housing versions, and the installation procedure are described.

We present seismological data quality analysis, both in time and frequency domain,

and also compare it with data from other sensors installed in the observatory, to demonstrate validity of the installation and measure ambient factors influencing the recorded seismic signal.