GEODIS (Geophysical Diving Saucer): A portable ocean bottom broadband seismic station

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The last ten years have seen the simultaneous development of a global seismic network coordinated throught the FDSN (Federation of Digital Seismograph Networks) and of portable broadband seismic arrays. The same approach can be followed for improving our scientific understanding of the Earth processes below oceanic areas. These both components of ocean bottom geophysical networks, might be coordinated by ION (international Ocean Network). They are complementary since they enable to investigate the Earth structure and processes at different spatial and temporal scales. Geophysical Ocean bottom observatories (hereafter referred as GOBO) and portable seismic stations are sharing common technological problems. However, the issues of power supply and real-time data transmission are more crucial for a GOBO than for a portable temporary station. Since 1999, our group is developing a new "portable" geophysical ocean bottom autonomous station, named GEODIS. This station might be a basic element for a GOBO. It relies on the use of adapted VBB sensors issued from space experiments and technology and on improved electronics compared with previous ocean bottom experiments (SISMOBS/OFM 1992; MOISE 1997). The main characteristics of GEODIS are the following:

• 3 axes VBB seismic sensors with a classical flat velocity response 360-0.2s. at 2500V/m/s (intrinsic noise level smaller than LNM).

• Automatic (under software control) installation, leveling, centering of the 3 component seismic sensors.

• 24 bit digitizer recording at 20sps, 3 seismic component and 1 infrasonic sensor.

• Recording by a 16 bit converter at 1sps of the sea temperature in the vicinity of the instrument and of housekeeping parameters (temperature, inclinations, power, ...).

• 1 year autonomy by using Lithium batteries.

• Storage of data on Flash card and recording on hard disk every day.

• Weight of GEODIS: 186kg in air and 110kg in water.

• Overall dimensions: 930 x 930 x 440 mm. GEODIS can be easily installed by a small oceanographic vessel.

Therefore, GEODIS has been designed in order to be reliable, with a low power consumption, to be financially affordable, to have excellent perfomances of sensors, to be easy to install and to recover.