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The Bremen Ocean Bottom Tiltmeter (OBT) in the Logatchev Hydrothermal Vent Field

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The Bremen Ocean Bottom Tiltmeter (OBT) is designed for autonomous high resolution deep sea tilt measurements at operation depths down to 6000m and logging duration of one year. Installation and retrieval of OBTs will be done by means of a remote operated vehicle. A first OBT was deployed in the Logatchev Hydrothermal Vent Field (LHF), Mid-Atlantic Ridge, 14.45°N in a depth of 3053m during research vessel 'Meteor' cruise M64/2 in May 2005. It records sea floor deformation correlated with micro seismicity, subsurface hydrothermal fluid flow and vent activity.

OBTs can be used as geophysical or geodetical tool in various applications. Examples are monitoring of ground motion at continental margins (sea floor land slides), observation of material flow at asphalt volcanoes, stability control of the sea floor in the vicinity of offshore constructions or measurement of subsidence that is related to hydrocarbon exploitation.

An OBT has a biaxial Applied Geomechanics Inc. bubble tilt sensor of type 756 with resolution of 1microradiant, a range of $\pm$10degree and an integrated thermistor with resolution of 0.01K. As additional sensor, OBTs use a vertical Micro-Electro-Mechanical-System (MEMS) accelerometer of type Kistler Servo K-Beam 8330A2.5 to assess micro seismic level and gravity in the low frequency range from DC to 1Hz with a resolution of 10^{-5}m/(s*s).

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