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The installation of a sub sea floor observatory using the sea floor drill rig MeBo

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Sea floor drill rigs that can be deployed from standard research vessels are bridging the gap between dedicated drill ships that are used for deep drillings in the range of several hundred meters below sea floor and conventional sampling tools like gravity corers, piston corer or dredges that only scratch the surface of the sea floor. A major advantage of such robotic drill rigs is that the drilling action is conducted from a stable platform at the sea bed independent of any ship movements due to waves, wind or currents. At the MARUM Center for Marine Environmental Sciences at the University of Bremen we developed the sea bed drill rig MeBo that can be deployed from standard research vessels. The drill rig is deployed on the sea floor and controlled from the vessel. Drilling tools for coring the sea floor down to 70 m can be stored on two magazines on the rig. A steel-armoured umbilical is used for lowering the rig to the sea bed in water depths up to 2000 m in the present system configuration. It was successfully operated on ten expeditions since 2005 and drilled more than 1000 m in different types of geology including hemipelagic mud, glacial till as well as sedimentary and crystalline rocks.

MeBo boreholes be equipped with sensors and used for long term monitoring are planned. Depending on the scientific demands, a MeBoCORK monitoring system will allow in situ measurements of eg. temperature and pressure. The “MeBoCORK” will be equipped with data loggers and data transmission interface for reading out the collected data from the vessel. By additional payload installation on the MeBoCORK with an ROV it will be possible to increase the energy capacity as well as to conduct fluid sampling in the bore hole for geochemical analyses. It is planned to install a prototype of this additional payload with the MARUM ROV QUEST4000M during the following R/V SONNE cruise in July 2012.