



Drilling gas hydrates with the sea floor drill rig MARUM-MeBo

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Large amounts of methane are bound in marine gas hydrate deposits. Local conditions like pressure, temperature, gas and pore water compositions define the boundaries of gas hydrate stability within the ocean sediments. Depending on those conditions gas hydrates can occur within marine sediments at depth down to several hundreds of meters up to sea floor. These oceanic methane deposits are widespread along continental margins. By forming cement in otherwise soft sediments gas hydrates are stabilizing the seafloor on continental slopes.

Drilling operations are required for understanding the distribution of gas hydrates as well as for sampling them to study the composition, microstructure and its geomechanical and geophysical properties. The sea floor drill rig MARUM-MeBo200 has the capability to drill down to 200 m below sea floor well within the depth of major gas hydrate occurrences at continental margins. This drill rig is a transportable sea floor drill rig that can be deployed from a variety of multi-purpose research vessels. It is deployed on the sea bed and controlled from the vessel. It is the second generation MeBo (Freudenthal and Wefer, 2013) and was developed from 2011 to 2014 by MARUM in cooperation with BAUER Maschinen GmbH. Long term experiences with the first generation MeBo70 that was operated since 2005 on 15 research expeditions largely contributed to the development of MeBo200. It was first tested in October 2014 from the research vessel RV SONNE in the North Sea.

In this presentation the suitability of MARUM-MeBo for drilling marine gas hydrates is discussed. We report on experiences drilling gas hydrates on two research expeditions with MeBo70. A research expedition for sampling gas hydrates in the Danube Paleodelta with MeBo200 as well as technical developments for improving the suitability of MeBo for gas hydrate exploration works are planned within the project SUGAR3 funded by the Federal Government for Economy and Energy (BMWi).

Freudenthal, T and Wefer, G (2013) Drilling cores on the sea floor with the remote-controlled sea floor drilling rig MeBo. *Geoscientific Instrumentation, Methods and Data Systems*, 2(2). 329-337. doi:10.5194/gi-2-329-2013