Paper Title: **MODUS – a Space Shuttle for Deepwater Interventions**

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Subject Categories: Primary: 20110 System Concepts, Field Development Evaluation Selection
Secondary: 50209 Seafloor Surveying and Mapping

Description of the Proposed Paper:

Following the world wide trend to deepwater intervention for offshore industry and ocean science, a heavy duty umbilical tethered system for deepwater deployment and recovery of abyssal sea bottom stations has been developed, built and successfully tested within the European project GEOSTAR (GEophysical and Oceanographic STation for Abyssal Research). The GEOSTAR system consists of the deep-sea space shuttle MODUS (MObile Docker for Underwater Sciences), with its sensor and thruster systems for homing-in control and dynamic positioning, the benthic observatory and an innovative near-real-time underwater communication system. This paper focuses on the description of the latest technological and scientific application of MODUS during its first operations in water depths up to 3700 m with the EC-projects GEOSTAR and BIODEEP (BIOtechnology from the DEEP).

Application:

MODUS is an umbilical driven deployment and recovery vehicle for precise operations with heavy payloads like deepwater observatories for seafloor surveys and deepwater intervention. Deep-sea operations in the Tyrrhenian Sea (2000 m.w.d.) with the complete GEOSTAR-system have proved the reliable performance of MODUS and the deep-sea station during a seven-month scientific mission (09/00-03/01). A modified version of MODUS has been developed for the BIODEEP project, which has been used for 17 deepwater missions (08/01-09/01) with water depths down to max. 3700 m.

Results, Observations, and Conclusions:

The high availability of the deep sea shuttle for handling and operating arbitrary intervention tools in deepwater environment is a basic requirement for application in industry and science. The latest success of the MODUS carrier system during extensive field operations like video field survey, remote operations of sampling tools etc. down to 3700 m demonstrates its availability with reliable performance.

Significance of Subject Matter:

MODUS is a field proven prototype of a carrier system for heavy payloads. It supplies extensive capabilities for deployment and recovery of autonomous benthic seafloor stations. Weights up to three tons can be precisely handled down to 4000 m water depth, operation is aided by state of the art video, sonar, altimeter and horizontal thrusters. Only one space shuttle is required to deploy, recover and operate various seafloor stations with arbitrary tools and equipment. Thus, it is a versatile and economic tool to operate, handle and maintain a spacious network of heavy-duty seafloor surveying stations.

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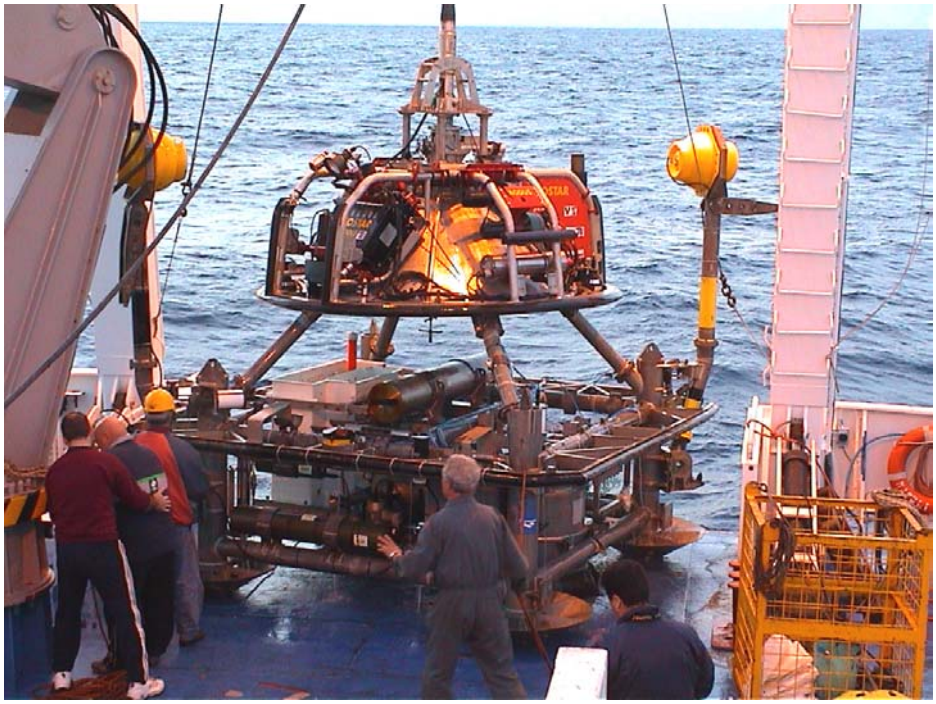
MODUS latched on GEOSTAR bottom station



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