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The *MiniROV*: A Multidisciplinary Research and Development Tool for Deep-Sea Exploration

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Abstract Text:

Remotely Operated Vehicles (ROVs) have long proved to be a powerful tool for conducting oceanographic research. However, most research-class ROVs are too large and complex to be moved easily between ships; even small inspection-class ROVs can be challenging to reconfigure for specific science missions. To fill this gap, MBARI has developed a portable, 1500 m rated, compact ROV, known as the *MiniROV*, to conduct ROV-based science on ships of opportunity. The core vehicle is designed as a generic platform that can be used for a wide variety of science applications. The vehicle is also equipped with interchangeable tool sleds that carry payloads specific to the science mission (e.g., midwater or benthic configurations). The *MiniROV* is equipped with a main HD science camera, additional auxiliary cameras, lights, a CTD, a five-DOF manipulator, a suction sampler, push cores, and sample drawers for biological and geological sampling. Recently, we have developed *SmartClump*, a node 50 m up-tether from the vehicle that provides a bird's-eye view of the vehicle and umbilical. In addition to being a crucial tool that enables the success of many expeditions both locally and globally, the *MiniROV* serves as a useful platform for developing complex instruments and algorithms in MBARI's test tank prior to field trials. This process has accelerated the development cycle, allowing us the rare ability to work out integration and operational issues that normally arise when deploying a new instrument on an ROV before ever going to sea. This presentation will discuss technical details of the *MiniROV* system, and show examples of how this fly-away system has become a valuable development test bed.

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