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TELEROBOTICS IN THE DEEP OCEAN

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Remotely operated vehicles can be made more useful for a wide range of survey tasks through the use of precision navigation and automatic control integrated under a proper supervisory control framework. Tasks ranging from scientific survey to ship hull inspection can be done more productively and produce a more useful result if the motions of the ROV are tightly controlled. A key benefit of automatic control is the ability to repeat a track at a later time to study dynamic processes seafloor.

This paper presents experimental results of the control system for the JASON ROV that has been designed for precision survey and other automated applications. The JASON control system emphasizes a form of supervisory control where the human pilot and the automatic system share the control task. Results presented included hovering, automatic track following, and several interactive modes.

JASON is equipped with an underwater manipulator that can exhibit a wide range of compliance through a combination of mechanical design and software control is described and its performance characterized. The major goal of the design was to produce a manipulator that can control the interaction forces with the work task and can work reliably in the hostile deep-ocean environment. The manipulator's performance has been characterized in the lab and its overall operational utility has been confirmed during an archaeological excavation at 700 meters depth in the Mediterranean. Results from the lab tests and sea trials will be presented.