

147-th Meeting of the Acoustical Society of America  
New York, NY, May 2004.

## **Acoustic Communications and Autonomous Underwater Vehicles**

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Acoustic communication systems used on autonomous underwater vehicles (AUVs) provide supervisory control, access to real-time data, and also allow multiple vehicles to cooperate in undertaking adaptive sampling missions. However, the use of acoustic systems on AUVs presents special challenges because of limited space for optimal placement of transducers, and potential conflict with other acoustic systems such as side-scan sonars and transponders. In addition, radiated and structure-borne acoustic interference from thrusters and actuators reduces the sensitivity of on-board receivers. Recent work in acoustic communications and AUVs has included combining some navigation functions into communications equipment, development of operating modes that remove conflicts between different subsystems, design of vehicle components to avoid or remove interference, and other approaches to improving performance. While these efforts have been successful for specific installations, many challenges remain. This talk addresses problems and solutions for supervised and completely autonomous multi-vehicle communications to support complex AUV missions. Also presented are recent results which demonstrate that acoustic communications can be used successfully on a variety of AUV platforms for many different applications. This work was supported by the Office of Naval Research.