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**An in situ sediment sound speed measurement platform: Design,  
operation and experimental results**

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A unique Sediment Acoustic-speed Measurement System (SAMS) was developed to directly measure sediment sound speed. The system consists of ten fixed sources and one receiver. In a typical deployment, the SAMS is deployed from a ship that is dynamically positioned. The sources are arranged just above the sea bottom and the receiver is drilled into the sediment with controlled steps by a vibro-core. The maximal sediment penetration depth is 3 meters. At each receiver depth, the 10 sources transmit to the receiver at different angles in the frequency range of 2-35 kHz, providing 10 estimates of sound speed through time-of-flight measurements from the known source-to-receiver geometry. SAMS was deployed three times during the recent Shallow Water Experiment 2006 (SW06) on the New Jersey shelf at 80 m water depth. Preliminary results of sediment sound speed are  $1618 \pm 11$ ,  $1598 \pm 10$ , and  $1600 \pm 20$  m/s at three separate deployment locations. Little dispersion in sediment sound speed was observed. (Work supported by ONR)