

## **ACOUSTICS2008/118**

### **Modeling ocean reverberation under short pulse conditions**

Henry Weinberg

Alion Science Incorporated, 23 Colonial Drive, Waterford, CT 06385, USA

The Comprehensive Acoustic System Simulation (CASS) is a standard model for predicting ocean reverberation. However, the current version, CASS V4.1, is known to have theoretical and numerical difficulties when investigating short pulse lengths. This is due to two model requirements: (1) the time increment for sampling reverberation should not exceed the pulse length; and (2) the range increment for sampling the environment should not exceed half the sound speed-pulse length product. Unless these requirements are met, certain phenomena, such as time splitting, may not be accurately modeled. In addition, the predicted results may have an unrealistic step function appearance. On the other hand, very small time and range increments often lead to excessive computational requirements. A simple modification to CASS V4.1 appears to have relaxed the current increment requirements substantially. The range increment must still be small enough to sample environmental features, but not to the extent dictated by small pulse lengths. Although the modification is based on a well known mathematical method for accelerating convergence, its success in modeling reverberation was unexpected.