

LABORATORY COMPARISONS OF
OPTICAL SCATTERING INSTRUMENTATION

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ABSTRACT

The emergence of instrumentation capable of making direct measurements of inherent optical properties (IOPs) has enabled investigations of the fundamental characterization of light attenuation in aquatic environments. Evaluation of the range, precision and accuracy of the available instrumentation is necessary to allow for the comparison and interpretation of ocean field data as well as establishing the validity of deriving other parameters from the measured values. During the week of May 6-10, 2002 a collaborative workshop was conducted to assess the current capabilities for measuring

the angular scatter of light in situ. Experiments based in reagent grade water were conducted with 600 nm, 1 micron, and 3 micron polystyrene microspheres and Maalox[®], an over the counter antacid treatment. Systematic additions of the microspheres and Maalox[®]; were made to sequentially change the scattering regime from clean water to single and multiple scattering environments. Raw water collected from the Patuxent River, MD was also used as a test media. Simultaneous measurements were made with the following instrumentation: VABAM, ECO-VSF, and ac-9 (WETLabs, Inc); LISST (Sequoia Scientific, Inc.); a-Beta, c-Beta, Hydroscat-6 (HOBI Labs, Inc.); GASM (U. Miami), and VSM (MHI NASU and Satlantic Inc.). Primary goals of the data analysis are determining under what conditions the measurements with the different instruments agree and how well a given instrument can be used to define (measure or infer) the near forward and near backward regions of the optical volume scattering function (VSF). The long term objectives include, developing a series of tests to allow the determinations of the causal factors (e.g. optical geometry, source/receiver stability, range/sensitivity limitations) for instances of disagreement between techniques, and to ensure the appropriate instrument protocols are available for use by researchers across the broad range of oceanographic and limnologic disciplines.