

# OCEAN OPTICS XXIV

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<https://oceanopticsconference.org>

Monday, October 8

Poster Session 1

16:00–18:00

## Poster 252

### **MULTIPLE NEUTRAL DENSITY FILTERS PROVIDE ROBUST AIR CALIBRATIONS OF TRANSMISSOMETERS**

Transmissometers measure the optical density of seawater between a light source and a detector. We report on the development of a technique using multiple neutral density filters to track transmissometer performance. Typically, water and air calibrations are used to monitor changes over an instrument's life. Water calibrations require a well constrained water source and are often difficult or impossible to perform in the field. Air tracking is simpler and for single wavelength transmissometers has been the standard for many years. However, both air and water calibrations only yield maximum or zero attenuation values and do not address changes in instrument response with variable target loading, i.e. we assume transmissometers are linearly driven Beer's Law instruments. Because this is generally true, measurement artifacts that occur from unclean optical surfaces including biofouling can be addressed by adjusting the offset of the instrument to an assumed minimal value in the field. This then leaves us with an instrument that is very useful for monitoring larger signals at the ocean margins but at the cost of smoothing away the smaller signals of the ocean interior. Multiple filters offer the advantage of a statistical measure of the transmissometer's performance over the range of the instrument. The technique is simple enough to be used routinely in monitoring an instrument over time, it is particularly powerful as a deployment check of performance, and can be used to adjust data post deployment.

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