AMT29 (Oct-Nov 2019) ACs Processing Report V1

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**Measurements**

Hyperspectral absorption and attenuation were measured continuously on board the R/V Discovery during the *AMT29* expedition in the Atlantic October 12, 2019, to November 25, 2019, using a WetLabs ACS spectrophotometer (serial number 122). The AC spectrophotometer was set after a switching system running 0.2 um filtered sea water through the instrument the first 10 minutes of every hour and bulk (“normal”) seawater was flowing the rest of the time. This setup allows to retrieve particulate absorption and attenuation independently from the instrument drift and the biofouling effect (Slade et al., 2010). The 0.2µm filter was changed approximately every 7 days and the ACs was cleaned every other day.

**Processing notes**

Data was processed following Dall'Olmo et al. (2009, 2012), using a custom software for in-line optical data processing (<https://github.com/grgdll/AMT29_uway_ACS>).

All in-line instruments were logged on the same computer which was synchronized with the ship’s GPS date/time and latitude/longitude. Total and filtered data were first separated according to the time stamp.

For each minute of the total seawater measurement, the median signal was computed. Particulate spectra are computed as the difference between total and interpolated dissolved spectra from the periods before and after the ‘total’ measurement periods (e.g. Dall'Olmo et al., 2009; Slade et al. 2010).

Scattering and temperature/salinity corrections are done as in Slade et al. (2010) and are based on Zaneveld et al., (1994)’s proportional scattering correction (method 3) and on the AC-s specific temperature/salinity tables of Sullivan et al. (2006).

**Figure 2:** Example of dissolved absorption spectra between 2021/05/02and 2021/06/01 measured with the ACS091

**References**

Dall’Olmo, G., Westberry, T. K., Behrenfeld, M. J., Boss, E. & Slade, W. H. Significant contribution of large particles to optical backscattering in the open ocean. BIOGEOSCIENCES 6, 947–967 (2009).

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