***DATA ANALYSIS FOR SCATTERING AND BACKSCATTERING COEFFICIENT AND GUIDING QUESTIONS:***

(e.g. Boss and Pegau, 2001, Boss et al., 2004, Mueller et al., 2003, McKee et al., 2008, Zhang et al., 2009, Sullivan and Twardowski., 2009 and Leymarie et al., 2010)

Using the calibration constants provided by the manufacturer convert the counts measurements to values of the VSF at one angle.

β*(*θ*)*=(signal measured - dark) x conversion-factor

Because the VSF of salt-water and particles are very different, we first remove from the signal the VSF of salt water (or 0.2µm filtered background):

β*p(*θ*)*=β*(*θ*)* - β*sw(*θ*)*

Where β*sw(*θ*)*is obtained from Zhang et al., 2009 (Optics Express, 5698-5710, m-file on class folder, and also as text at the end of this handout). How big (in %) is this correction for your sample?

Correct VSF for absorption along the path.

β*p(*θ*)*=β*p(*θ*)*e*L(a+*ε*b)*

Where *L* is the pathlength (from manufacturer), *a* is the *total* (including water) absorption coefficient, *b* total scattering coefficient and ε, the fraction of scattering that is collected by the detector. Hydroscat manufacturer use ε=0.4 based on the Petzold VSF. WET Labs recommends using *a* only).

 

Convert particulate VSF to particulate backscattering using conversion from a single angle.



*Table 1 from Boss and Pegau, 2001. A more recent table (with similar values at the angles used for backscattering instruments) can be found in Sullivan et al., 2013.*

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