

PROCESSING and RTQC for BBP

PROCESSING (1)

From a single angle measurement of the VFS in the backward direction, the contribution of pure seawater, β_{sw} , has to be removed. The values of β_{sw} with dependencies on temperature and salinity and a depolarization ratio of 0.039 are derived from the study of Zhang et al. (2009).

$$\beta_p(\theta, \lambda) = \beta(\theta, \lambda) - \beta_{sw}(\theta, \lambda)$$

Using χ as a conversion factor, to extrapolate the measurement at a single angle to the total coefficient, it follows that :

$$b_{bp}(\lambda) = 2\pi\chi(\beta(\theta, \lambda) - \beta_{sw}(\theta, \lambda))$$

PROCESSING(2)

The basic equation allowing the retrieval of particle backscattering from raw transmitted measurement is:

$$\text{BBP700} = 2 * \pi * \chi [(\text{BETA_BACKSCATTERING700} - \text{DARK_BACKSCATTERING700}) * \text{SCALE_BACKSCATTERING700-} \\ \text{BETASW700}]$$

- *All informations: references, links... are reported in the document Processing particle backscattering at the DAC level*
- *This Calculation is already implemented at Coriolis*

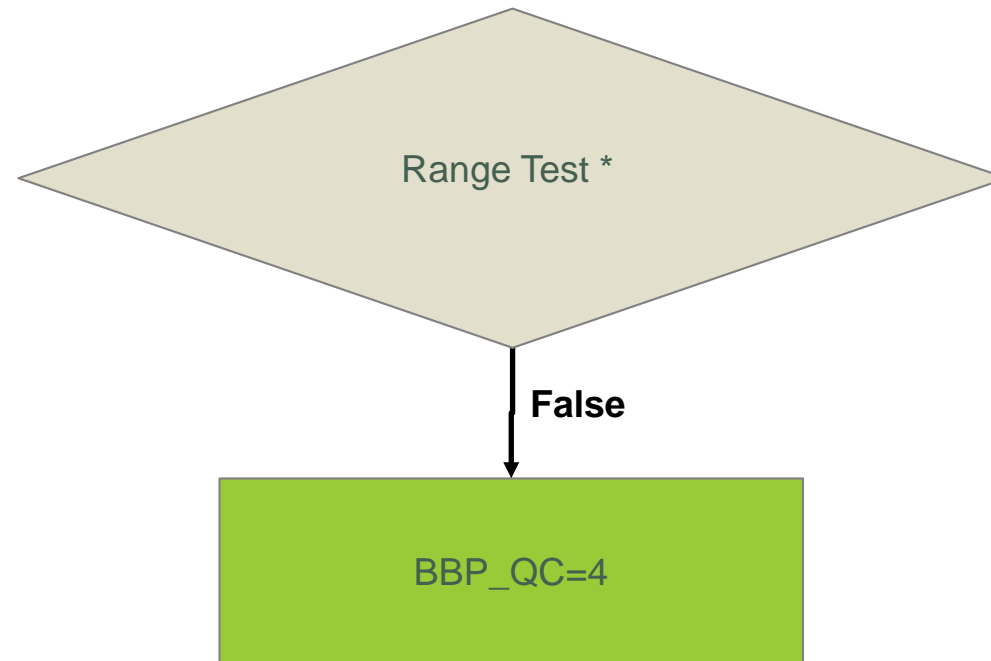
RTQC for BBP

To obtain the highest quality particulate backscattering estimates using the Eco sensor series from WETLabs :

- The dark value needs to be determined by the user or the float assembler (e.g. Sullivan et al., 2013).
- The sensor should be powered by the float in a configuration similar to the deployment.
- The sensor detector should be covered with opaque tape, leaving the light source fully exposed, and immersing the sensor in water
- Measurements of dark offsets are taken over a minute to determine both the average signal (the dark value) and the variability about the average (its uncertainty).

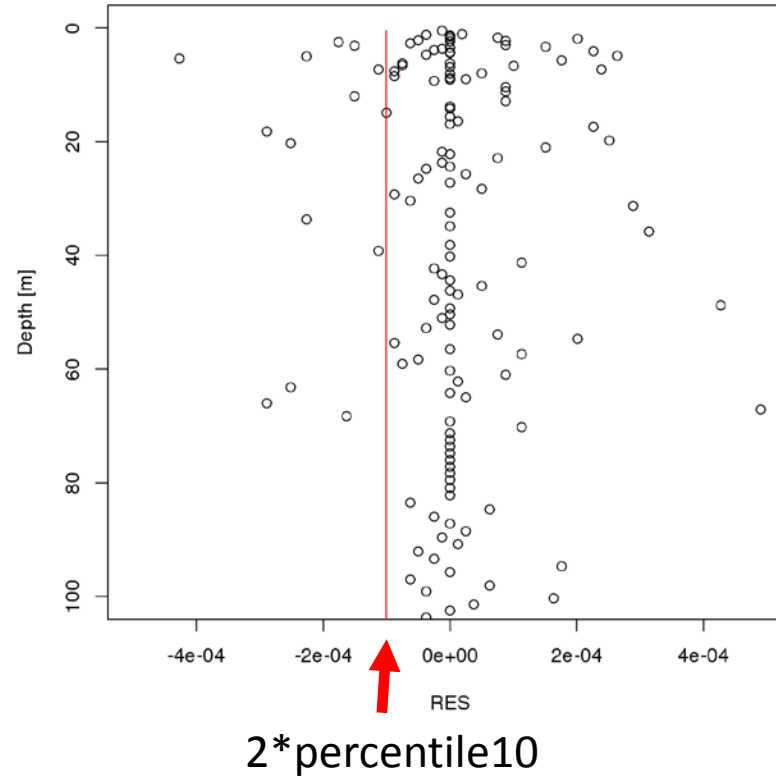
Range Test

- The range test values depend on the wavelength
- BBP700
 - Min = -0.000025 m^{-1}
 - Max = 0.1 m^{-1}
- BBP532
 - Min = -0.00005 m^{-1}
 - Max = 0.1 m^{-1}

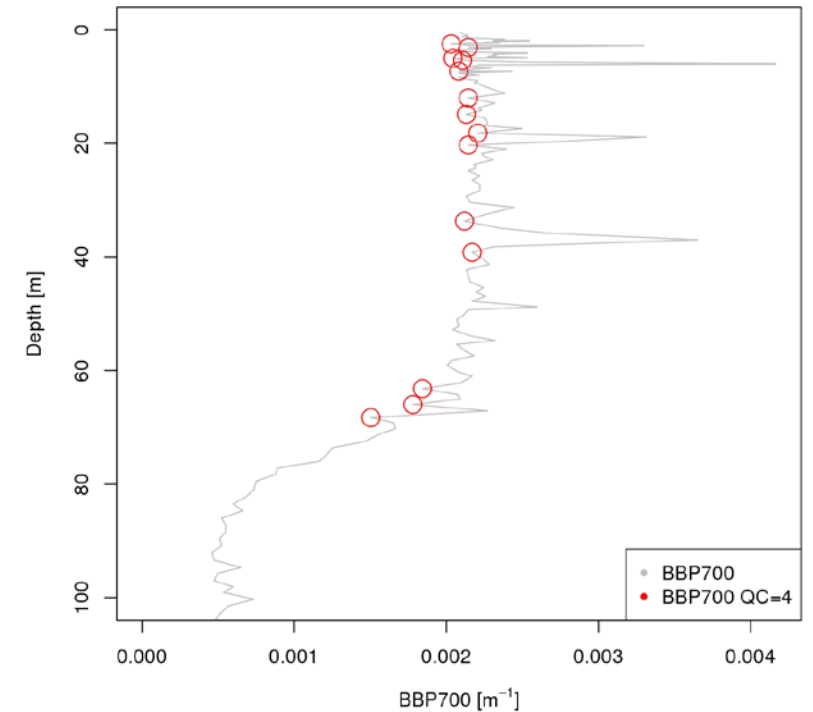


Spike test

- Calculate the difference between the BBP and a running median along the whole profile
 - Estimate the percentile10
 - $RES < 2 * \text{percentile10}$ (RES)
- => Negative Spikes



Float 6901511, profile 63



Spike test(2)

- Negative spikes are considered as Bad Data

