Real-time temperature and salinity quality control based on minimum/maximum estimates from the known local variability

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In the past years, delayed-time quality control (QC) procedures of temperature and salinity measurements at the French CORIOLIS facility have improved significantly thanks to the implementation and use of new methods with reduced statistical assumptions. In the context of the Copernicus Marine Environment Monitoring Service, this success led us to introduce the same concept into real-time processing.

With such an approach, observations are compared to the known local variability through validity intervals built from historical estimates of minimum and maximum values of the parameter of interest. No a priori assumption on the local parameter distribution shape is required, and natural skewness and kurtosis can be accounted for during the detection process.

In a delayed-time context, such a QC procedure is used to raise alarms that an operator will then visualize and potentially confirm. Thus, an improved automatic detection procedure essentially allows saving operator time through reduction of the number of false alarms.

In a real-time or near-real-time context, the available operator time is much reduced or even null. In order to implement such a procedure in an operational chain, it is fundamental to have a fine control of the total number of alarms. The method shall be adjusted to raise a manageable number of alarms, allowing small anomalies to pass through the filter while ensuring that the largest ones are systematically caught, being more likely associated to gross observation errors.

Consequently, such a QC procedure needs to be adapted and tuned before implementation in real-time processing. This presentation will focus on the design and the validation results conducted at CORIOLIS in 2018.