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Title: Near Real Time Processing of Underway Salinity Data from Ships of Opportunity

Abstract: The French Sea Surface Salinity (SSS) Observation Service is the main provider of thermosalinograph (TSG) observations from ships of opportunity at global scale, in real time (RT) for operational oceanography and in delayed time (DT) for research. We develop here a near real time (NRT) processing chain, which aims at transposing the human-operated DT processing into automatic algorithms to deliver data with optimal quality in less than a week. Quality Control (QC) flags are based on realistic instrumental thresholds, and comparison with a SSS climatology and colocated satellite temperature data. To correct instrumental SSS biases due to fouling, water samples used in DT are replaced by colocated Argo data in NRT. The method includes detection of ship harbour calls, when the largest biases appear. The NRT processing chain is retrospectively applied on a 2014-2019 TSG database, then evaluated and optimised by comparison to the same TSG database processed in DT, in terms of QC flags and corrections. Using a SSS climatology based on Mercator Global Reanalysis, NRT QC flags reach an 88% agreement with DT QC flags. Compared to unprocessed data, the differences with DT processed data are 4 to 5 times smaller after NRT QC and correction.

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