Abstract View

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Sensor Response Mismatches and Lag Correction Techniques for Temperature-Salinity Profilers

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ABSTRACT

Salinity-temperature-depth profilers measure temperature. directly but infer salinity from measurements of temperature, pressure and conductivity. Errors may therefore be introduced into the salinity data because of dissimilar response characteristics of the various sensors. This response mismatch usually manifests itself as the temperature signal lagging the conductivity signal in time. An error analysis demonstrates that amplitude underestimations of only 1% with a phase error of only 5° in the temperature data can result in a 20% overestimation of salinity variance. Techniques for removing the effects of sensor-response mismatches in the data are discussed and a new method is presented. The method involves the determination of correction filters for the data in physical space in terms of the response function of the sensors which is in frequency space. Thermohaline features on vertical scales smaller than 1 m appear resolvable in CTD data that are corrected with this technique.