



Assessing and Optimizing Argo profile mapping : An example in the Equatorial Pacific

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Estimation of subsurface temperature, salinity and velocity has been revolutionized over the last decade as a result of development and deployment of the Argo Program. Argo products have become one of the major observational tools in Oceanography, used in a wide range of basic research, operational models, and education applications. To assess the skill of Argo in estimating oceanic conditions at different scales of variability in the Equatorial Pacific, we optimize Argo profile mapping by focusing on the covariance function. Decorrelation scales are discussed as well as impacts of several different interpolation schemes. The optimization is based on three points 1) Functional representation of the Argo sampled covariance, 2) Realism/Accuracy of the mapping errors and 3) Comparison with independent data such as TAO moorings and sea surface height. The last points show that Argo can represent more than 90% of the total TAO variance and around 80% of the intraseasonal TAO variability (between 10 and 100 days) at the Equator. As an illustration of the improvement, we show how Argo profiles can reveal the vertical structure and vertical phase propagation corresponding to the steric height annual cycle. We also discuss how this unique equatorial wave phenomena is modified during El Nino/La Nina events. This work anticipates a field experiment beginning in early 2014 and can be used for assessing and adapting the equatorial observational network.