Hypernav Trajectory Prediction

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ABSTRACT

1. Introduction

The Hypernav project proposes to seed the worlds oceans with lagrangian hyperspectral cameras based on the Argo platform (Roemmich et al. 2019), and offers an innovative means to validate the PACE satellite (Frouin et al. 2019). Previous ocean color validation experiments have deployed instrumented moorings (Clark et al. 2003) to measure and transmit optical properties of the ocean. Instrumented moorings are typically expensive and difficult to maintain and require complicated logistics to deploy globally because of their vastly greater size and weight; lagrangian drifters on the other hand are typically less expensive than moorings and can be deployed by one or two people from the deck of almost any ship. Because of this scalability, proposals have been considered to deploy a distributed network of Hypernav drifters globally to allow for multiple validation locations as opposed to the one or two validation moorings that have been used to validate previous generations of ocean color satellites. This is not to say that lagrangian drifters do not suffer from their own drawbacks. Drifters inherently move about with ocean currents; this is problematic for two reasons: firstly, instrumented drifters are fragile and cannot survive groundings. Care must be taken to navigate drifters at depths such that they avoid the ocean floor. Secondly, the regions of ideal satellite validations are relatively small. If Hypernav floats drift too far, their observations will not be useful for sattelite validation. To address these challenges, we combine 2 technologies - a current prediction of the Hawaiian Islands (PacIOOS 2021), and a an open source particle trajectory prediction software package (Delandmeter and Sebille 2019).

2. Methods

3. Results

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Data availability statement. The data availability statement is where authors should describe how the data underlying the findings within the article can be accessed and reused. Authors should attempt to provide unrestricted access to all data and materials underlying reported findings. If data access is restricted, authors must mention this in the statement.

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