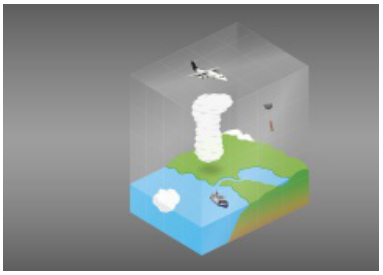

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Saildrone: A global class Unmanned Surface Sailing Vehicle for air-sea interaction observation and its potential as a reliable data source for NWP models

Thursday, 13 June 2019 11:00 (20 minutes)

Over the past decade, significant progress has been made in the global ocean observing system (GOOS), which is monitoring much of the upper ocean on a global scale in real time with multiple observing platforms. But observation of air-sea fluxes has been relying on fixed surface moored buoys and research and voluntary ships with limited spatial coverage. As a result, the current GOOS is not able to adequately observe the air-sea interaction processes across fronts and eddies. A recent technology development, the Saildrone, is an Unmanned Surface Vehicle (USV) powered by wind and solar energy with a range of more than 6,000 nautical miles, making it a potential platform to sample across fronts and weather systems over the global ocean. To make the Saildrones capable of observing air-sea interaction processes, we have installed sensors with equivalent or better quality than those currently used on Tropical Atmosphere and Ocean (TAO) buoys for air-sea flux measurements, and a 300-kHz Acoustic Doppler Current Profiler for upper ocean current measurements. So far, two pilot Saildrone missions have been completed in the tropical Pacific, as part of the Tropical Pacific Observing System (TPOS)-2020 project: one mission with two Saildrones deployed and recovered at San Francisco, California; the other one with four Saildrones deployed and recovered at Honolulu, Hawaii. Both missions reached the equator and sampled across the tropical Pacific cold tongue fronts and oceanic vortices. We will present the Saildrone data from these TPOS missions and use these results as an example to demonstrate the potential of Saildrones for air-sea interaction studies over the global ocean. While the Saildrone observations can provide the needed data to the Numerical Weather Prediction (NWP) models, the NWP forecasts are essential for the planning and execution of Saildrone missions for navigation and better sampling strategies. Through this presentation, we hope to open the dialogue between the USV observation and NWP modelling communities to facilitate future collaborations in better collection and use of the air-sea interaction data collected by these new platforms.

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