

Evaluating the surface layer circulation derived from Lagrangian drifters and satellite products in the Marquesas archipelago, South Pacific Ocean.

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The Marquesas form an isolated group of small islands in the Central South Pacific Ocean where an outstanding biological activity (referred as the island mass effect) is observed as compared to the surrounding oceanic waters. A recent work based on surface drifters and satellite derived surface currents has shown the impact of eddy advection on the plume of Chlorophyll-a (a proxy of phytoplankton biomass) in this archipelago. However, this study has also shown the overestimation of the Ekman component on the satellite surface current when compared with 15 drifters launched during an oceanographic cruise in October 2018.

Based on Lagrangian drifter trajectories collected since the 1990s, the aim of this work is to investigate further the seasonal climatology and the variability of the surface circulation in the Marquesas archipelago. The buoys deployed during several international programs and cruises are fitted with drogues at depth of 15 m in order to follow the current in the surface layer. After a processing of the full dataset, trajectories of drifters should be carefully evaluated and validated in order to describe the mean and the seasonal circulation. Comparisons will consider additional products such as the GEKCO currents derived from satellite missions (altimetric + Ekman components), both from a Lagrangian and Eulerian point of view (in the latter approach, Lagrangian computations would be based on the ARIANE software developed at LOPS). Depending on the capability of the Lagrangian drifters to depict the ocean dynamics, the focus of the work will be set on the potential relationship between the island mass effect and the eddy variability of the surface layer.

Tools: programming in Matlab or python, visualization in ferret or other...