ABSTRACT'S DETAILS

OCEAN DYNAMICS CONTROL OF THE STERIC SEA LEVEL SEASONAL CYCLE

Antoine Hochet (CNRS, France)

CoAuthors

William Llovel (CNRS, FRANCE); **Thierry Huck** (CNRS, FRANCE); **Florian Sevellec** (CNRS, FRANCE)

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Abstract:

Along the mean sea level rise due to climate change, the sea level exhibits natural variations for a large number of different time scales. One of the most important is the one linked with the seasonal cycle.
Since the first high-precision altimetry mission, Topex-Poseidon launched in 1992, accurate measurements of sea level variations, in particular of the seasonal cycle, are available with a +/- 66 degrees latitude coverage.
These meaurements show that in the Northern Hemisphere winter, the sea level is as much as 20~cm below its summer values in some locations. It is customary to associate these variations to the seasonal cycle of the sea surface net heat flux. The prevailing hypothesis is that, the excess of heat received by the ocean leads to a thermal expansion of the surface water and in turns creates a positive steric sea level anomaly. Here, using a novel framework based on steric sea level variance budget applied to observations and to the Estimating the Circulation and Climate of the Ocean state estimate, we demonstrate that the steric sea level seasonal cycle results in fact from a balance between the seasonal sea surface net heat flux and the oceanic advective processes. Moreover, for up to 50% of the ocean surface, surface heat fluxes act to damp the seasonal steric sea level cycle, which is instead forced by oceanic advection processes. We also show that eddies play an important role in damping the steric sea level seasonal cycle. Our study reveals that oceanic processes are much more important in setting the sea level seasonal cycle than previously assumed and contributes to a better understanding of their mechanisms which is crucial to better interpret the satellite measurements and to ensure accurate and reliable climate projections.

Oral presentation show times:

Room	Start Date	End Date
Grande Beach Room (#208)	Fri, Nov 10 2023,**14:00**	Fri, Nov 10 2023,**14:13**

Antoine Hochet
CNRS
France
antoine.hochet@univ-brest.fr