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POST-DOC

«Deep learning for the reconstruction of oceanic currents from multi-platform observations»

Abstract

'While the ocean covers up to 70% of the Earth's surface, only 10% of the ocean is considered as explored. Nonetheless, it plays an active role in the climate regulation through the interaction of oceanic processes of multiple spatial-temporal scales, which must be monitored. From satellites to Argo floats, diverse observing platforms have arisen over the last decades, which fostered operational oceanography advances. However, these observations aren't enough compared to the immensity of the ocean. Nowadays, computational resources enable us to explore deep learning techniques to optimise the information retrieved by each observation but also to optimise the acquisition of these data in an integrated approach. In a theoretical framework and with simulated observations, we explore how deep learning can enhance the assimilation of data for the reconstruction of sea surface velocities. We also assess how the combine use of satellite and in situ data can lead to an overall better reconstruction of the sea surface velocity field on a 10°x10° region along the main meander of the Gulf Stream in the Atlantic Ocean. Finally, we propose an innovative sampling strategy to improve the quantification of kinetic energy exchanges of eddies and filaments generated in this area of study.'