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LPO/IFREMER
Keynote
Theoretical and numerical studies of the last ten years have higlighted the significant impact of the meso/submesoscale eddies and fronts (in particular in the scale range 10 km -100 km) on the larger-scale ocean dynamics and on the vertical transports of any properties. These meso/submesoscale structures have been found to represent a significant part of the ocean surface kinetic energy and, because of their aspect ratio (vertical to horizontal), to explain a large part of the 3D dynamics (including vertical motions) in the first 500 m below the surface.

The new class of wide-swath altimeters (such as SWOT and COMPIRA) should be able to monitor the surface dynamics of this meso/submesoscale turbulence. Furthermore, as pointed out by some recent studies, they may have the potential to estimate the 3D dynamics of the first 500 m (with the help of theoretical arguments and using some interior data at large-scale). As such these altimeters open a new exciting, very important and unique avenue not only for the ocean dynamics but also for the physical-biological - as well as the air-sea - interactions.

To be able to fully exploit the strong potential of these new altimeters when data will become available, some scientific questions have still to be addressed such as for example, the interactions between the mesoscale/submesoscale dynamics with the interior dynamics and, with the unbalanced motions (internal tides, inertial motions, mixed-layer dynamics ...). Other questions concern the potential synergy between these new altimeters and the existing satellite data. To address these questions in the next future, an international effort should be put in coordinating scientific research on ocean dynamics on scales between 10 km and 100 km.

This talk will review these recent results on mesoscale/submesoscale turbulence as well as the questions to be tackled in the next future. It will present some strategies to move forward. At last it will introduce the new international working group on mesoscale/sub-mesoscale processes (bringing together observationalists, modellers, theoreticians) whose mission is to further refine, extend and, coordinate these strategies.
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