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Autore	Chapron Bertrand
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Nota di contenuto	Internal tides energy transfers and interactions with the mesoscale circulation in two contrasted areas of the North Atlantic -- Sparse-stochastic model reduction for 2D Euler equations -- Effect of Transport Noise on Kelvin–Helmholtz instability -- On the 3D Navier-Stokes Equations with Stochastic Lie Transport -- On the interactions between mean flows and inertial gravity waves in the WKB approximation -- Toward a stochastic parameterization for oceanic deep convection -- Comparison of Stochastic Parametrization Schemes using Data Assimilation on Triad Models -- An explicit method to determine Casimirs in 2D geophysical flows -- Correlated structures in

a balanced motion interacting with an internal wave -- Linear wave solutions of a stochastic shallow water model -- Analysis of Sea Surface Temperature variability using machine learning -- Data assimilation: A dynamic homotopy-based coupling approach -- Constrained random diffeomorphisms for data assimilation -- Stochastic compressible Navier–Stokes equations under location uncertainty -- Data driven stochastic primitive equations with dynamic modes decomposition.

Sommario/riassunto

This open access proceedings volume brings selected, peer-reviewed contributions presented at the Third Stochastic Transport in Upper Ocean Dynamics (STUOD) 2022 Workshop, held virtually and in person at the Imperial College London, UK, September 26–29, 2022. The STUOD project is supported by an ERC Synergy Grant, and led by Imperial College London, the National Institute for Research in Computer Science and Automatic Control (INRIA) and the French Research Institute for Exploitation of the Sea (IFREMER). The project aims to deliver new capabilities for assessing variability and uncertainty in upper ocean dynamics. It will provide decision makers a means of quantifying the effects of local patterns of sea level rise, heat uptake, carbon storage and change of oxygen content and pH in the ocean. Its multimodal monitoring will enhance the scientific understanding of marine debris transport, tracking of oil spills and accumulation of plastic in the sea. All topics of these proceedings are essential to the scientific foundations of oceanography which has a vital role in climate science. Studies convened in this volume focus on a range of fundamental areas, including: Observations at a high resolution of upper ocean properties such as temperature, salinity, topography, wind, waves and velocity; Large scale numerical simulations; Data-based stochastic equations for upper ocean dynamics that quantify simulation error; Stochastic data assimilation to reduce uncertainty. These fundamental subjects in modern science and technology are urgently required in order to meet the challenges of climate change faced today by human society. This proceedings volume represents a lasting legacy of crucial scientific expertise to help meet this ongoing challenge, for the benefit of academics and professionals in pure and applied mathematics, computational science, data analysis, data assimilation and oceanography.