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Atmospheric-Wave-Current interactions in a wind-jet region: the case of the Ebro Delta shelf

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The atmospheric-wave-current interactions are investigated using both numerical modelling and observational data in a very complex area such as the Ebro Delta Shelf. This area is characterized by the persistent and energetic offshore winds during autumn and winter. Wind, waves and ocean currents were compared with "in-situ" observations and remote-sensing-derived products with an acceptable level of agreement. Focused on an intense offshore wind event, the modelled wind jet appears in a limited area offshore with strong spatial variability. The wave pattern during the wind jet is characterised by the development of bimodal directional spectra, and the ocean circulation tends to present well-defined two-layer flow in the shallower region (i.e. inner shelf). The relevance of the physical interactions are examined using a coupled ocean-atmosphere numerical model. Also, new generation remote sensing products (i.e. Sentinel) are analysed in order to characterize the spatial and temporal variability of meteo-oceanographic variables in a coastal area such as the Ebro Delta.