



## **Atmospheric-induced effects on the sea surface: Madeira Island wake case study**

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The Madeira Island atmospheric-induced ocean wake was investigated combining remote sensing and in situ data analysis with numerical studies. The SAR imagery archive analyzed, for the Madeira region, is dominated by wind-induced oceanic features. Concurrent MODIS and SAR data showed warm SST (Sea Surface Temperature) water within the wake region and cold SST in the exposed (open-ocean) regions. The sheltered regions were also associated to weaker winds and currents. In situ-data, from an opportunistic ocean campaign (June 2010) showed a vertical structure associated with the occurrence of weak wind-mixing and strong-heating episodes, leeward of the island. Weaker wind and strong solar radiation has also shown to have important implications in the oceanic vertical stratification. Numerical experiments using a primitive equation numerical model (ROMS – Regional Ocean Modeling System), forced by high resolution winds calculated from WRF – Weather Research and Forecast model, showed stress features detached from the island coast, associated with the upwelling of cold water, in the island wake region. A better understanding of such an effect is expected when the study considers the superimposed effect of solar radiation, using the offline coupling of these two numerical systems.