



A multiplatform data experiment to characterize waves and currents in front of Biarritz main beach

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Quality physical oceanographic data such as currents and waves are needed to understand processes and produce forecasts for multiple scientific, management and industry applications. Some of the applications that require currents and waves data are the estimation of climate change impacts, marine species distribution changes, litter accumulation in beaches and vessels fuel consumption. The X-band radar can provide such currents and waves data in near real time.

An X-band radar (transmission frequency: 9410 ± 30 MHz) was installed in Biarritz in March 2021 and it is expected to acquire data until the end of February 2022, as part of the SusTunTech project (<https://www.sustuntech.eu/the-project/>). Since its installation, the x-band radar has been measuring data non-stop, except during few days (due to power failures). The radar is monitoring oceanographic processes at coastal scales in this shallow water coastal area up to 3.2 km offshore. The main parameter extracted from the radar data are spectral wave parameters such as significant wave height, peak wave period and direction as well as surface current fields. During a short calibration phase, the marine radar has to be calibrated for significant wave heights utilizing in situ measurements. For accurate surface current measurements from the X-band radar, the tidal water depth variation of up to 4 m in the study area is being taken into account. Four ADCPs and two pressure sensors were installed in the area covered by the x-band radar from March to May 2021 as part of MARLIT project (<https://www.suez.com/en/news/marlit-project-prevention-storm-related-risks-protection-coast-against-climate-change>) to strengthen the x-band radar data information.

The presented multiplatform experiment (*in-situ* data from MARLIT project and X-band from SusTunTech project) is allowing to compare the measurements of the same variable by different instruments and find complementarities of these instruments to characterize the wave regime and the surface currents of the study area. In addition, these measurements will be utilized to validate and better understand the remarkable intensification of significant wave heights suggested by local wave models at specific locations within the area covered by the X-band area (Varing et al. 2020). Finally, the better knowledge acquired about the longshore distribution of wave and current

energy will help to assess local early warning systems to prevent storm-related risks along the highly urbanized coastline of Biarritz. Nowadays, such systems are increasingly being used by scientists, policy and industry in their activities. Therefore, the importance of producing quality data to feed modelling and its applications.