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MONIZEE: An eye over the Portuguese coastal ocean, a window onto impacts on the eastern North Atlantic

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A real-time monitoring system for the Portuguese Exclusive Economic Zone (MONIZEE system) was installed by Instituto Hidrográfico, the Portuguese Hydrographic Office. Starting from a number of monitoring capacities already existent since the 1970s, such as coastal tidal gauges and wave buoys networks, the system was expanded during the last decade by the inclusion of networks of multiparametric buoys and HF radar stations. At its present stage of development the MONIZEE system covers the coastal ocean area off the Portuguese mainland. It extends for more than 1000km along a particularly interesting area of the North Atlantic eastern boundary layer that comprises the northern margin of the Gulf of Cadiz and the western Portuguese margin. The measurements collected at the fix-point stations that integrate the system are complemented with ship observations conducted as part of dedicated research surveys or in an opportunistic way. The MONIZEE system is presently contributing to global and European programs such as GTS and IBIROOS and integrates the European network of coastal observatories gathered under JERICO-NEXT. The installed capacities are also contributing to regional observatories such as the RAIA observatory (northwestern margins of Portugal and Spain) and the recently started OCASO observatory (southern margins of Portugal and Spain).
In this communication we present an overview of how the MONIZEE system is being used to monitor key oceanographic processes that characterize the Portuguese coastal ocean area and have a clear trans-boundary expression, promoting the connectivity between different regional areas along the European margin or linking the eastern boundary layer dynamics to the North Atlantic basin circulation. One of such processes is the poleward slope current which is forced along the western Portuguese slope and transports warm and saltier water of southern origin along the continental slopes of northern Portugal and Spain and western France. Examples will be given of the importance of this slope intensified flow as a fundamental mechanism for the spreading of contaminants or fish eggs and larvae along the European continental slope. The regional area covered by MONIZEE is also the scene of main adjustments processes followed by the Mediterranean Water and these define the expression of this water mass along the European and North African slopes and its connection with the Azores Current. Substantial changes of water mass characteristics, from the surface to the deep ocean, also occur in this regional area as the result of intense mixing and flushing events promoted inside long submarine canyons that are present here.
The contribution of the MONIZEE system to improve our understanding of these processes as well as the role presently played by this system in supporting coastal populations and marine policies are exemplified and discussed here. An overview of the near future development of the system, in particular the articulation with new monitoring technologies, will also be given.