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A new integrated oceanographic/atmospheric facility in the central Mediterranean: the instrumented buoy contributing to the Lampedusa Climate Observatory

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The Station for Climate Observations on the island of Lampedusa (35.52°N, 12.63°E; http://www.lampedusa.enea.it) has been operational since 1997 in the central Mediterranean Sea and is dedicated at long-term measurements of atmospheric parameters related to climate. Measurements, also made in collaboration with different international Institutes, contribute to several global networks (GAW/WMO; NOAA Cooperative air sampling network; AERONET; ICOS, etc.).

As an integration of the climate observatory, an oceanographic buoy was deployed in August 2015 about 3.3 miles South West of the island of Lampedusa, at 35.49°N, 12.47°E. The buoy was developed within the Italian RITMARE flagship project. The ocean depth at the buoy site is 74 m. Primary scientific objectives of the marine observatory are: to investigate air sea interactions in the central Mediterranean; to study the surface energy budget; to characterize the oceanic optical properties, and to investigate links with the carbon cycle. The site will act as a cal/val facility for satellite observations.

A first set of measurements of downwelling shortwave and longwave irradiances were activated in September 2015, and more than 1 year of continuous measurements are now available. The other instruments are presently being installed and will become operational soon. They include CTD, O_2, and temperature sensors at various depths; 7-band upwelling and downwelling radiation sensors at two depths; downwelling and upwelling solar (broadband and spectral) and infrared (broadband) irradiances at the surface; meteorological parameters. Additional developments are linked to the measurement of oceanic pCO_2 and atmospheric turbulence, including sensible heat fluxes. The buoy is open to further expansions and developments.