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Multiplatform analysis of a large anticyclonic eddy in the Algero-Provencal basin in 2019

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A large anticyclonic eddy formed in April 2019 in the Algero-Provencal basin between Mallorca and Sardinia, and lasted until November 2019. While mesoscale activity is usually high in this part of the Mediterranean basin, the formation of such large (about 150 km in diameter) and long-lived eddies is not common. The eddy formed from a filament originated in the Algerian coast and was visible in multiple sources of satellite data, including sea surface temperature and ocean colour from Sentinel-3, until summer. Because of the warming of the surface layer, during summer months the eddy remained as a subsurface structure, evidenced by the sea level anomaly derived from altimetry data. A surface signal developed again in November, and the eddy finally dissipated in December 2019. According to CMEMS model data, in its strongest period the eddy reached about 300 m in depth, and during its sub-surface period the center was located at about 100 m depth. While at the surface the temperature signal was very clear, model data suggest the salinity anomaly was stronger than temperature, especially at depth. Such large and long-lived eddies have an impact in the basin currents, specifically in the transport of cold water from the northern to the southern part of the western Mediterranean basin, influencing the ecosystem there. The impact of the presence of this eddy, its long duration and the additional mesoscale and submesoscale activity that originated in its surroundings are investigated using a combination of remote sensing data, in situ data and model data.