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# Observations and modelling of a shallow baroclinic anticyclonic eddy off Cape Bojador

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A shallow mesoscale anticyclonic eddy observed South of Canary Island from satellite altimetry has been intensively studied with multi-parametric sampling and model simulations. Between 9 and 11 November 2008, hydrographic observations were gathered South of Canary Islands using a Nu-Shuttle, an undulating towed vehicle equipped with Conductivity-Temperature-Depth sensors. The survey consisted of 4 parallel Northeast-Southwest legs in a box ∼35 km wide and ∼150 km long. Additionally, on 11 November 2008, just after completing the Nu-shuttle sampling, deep CTD casts from ship were performed along a radial section crossing the center of the study area roughly at 30 km spacing and reaching either 500 or 1000 m deep. Two weeks later, on 28 November 2008, the vessel revisited the area, collecting additional deep CTD casts (2000 m), at about 40 km intervals. The study area is dominated by North Atlantic Central Waters (NACW) with salinity values between 36.8 and 37.1 and temperatures between 21.5 and 22.3 ºC for the upper layer. Hydrographic data have been analyzed using an Optimal Statistical Interpolation (OSI) scheme and the dynamic height and geostrophic velocity have been estimated revealing the presence of a mesoscale anticyclonic eddy of ∼125 km diameter. Maximum dynamic height gradients (∼10 cm) and associated geostrophic velocities of about 35 cm/s are found in the northeast and southwest edges of the eddy. At 100 m depth, the horizontal dynamic height gradient is significantly reduced and the mean geostrophic velocity is lower than 5 cm/s. The deep CTD casts ship confirm that the structure is a shallow eddy extending no deeper than 150 m. Using the QG-Omega equation, downward/upward velocities of about -2/+2 m/day are diagnosed in the north/south part of the eddy, representing an important mechanism to supply nutrients to the upper layer. Finally, numerical model outputs from ROMS are also considered to assess the implementation of this model in a complex area such as the Canary region.