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Absolute geostrophic velocities off the coast of Southern Peru as observed from glider data

A. Pietri (1), P. Testor (1), V. Echevin (1), A. Chaigneau (2), L. Mortier (1), G. Eldin (2), C. Grados (3), and A. Albert (1)

(1) LOCEAN-IPSL, UPMC, Paris, France (alice.pietri@locean-ipsl.upmc.fr), (2) LEGOS-OMP, Toulouse, France, (3) Instituto del Mar del Peru, IMARPE, Chucuito-Callao, Peru

The upwelling system off southern Peru has been observed using autonomous underwater vehicles (Slocum gliders) during two glider missions in October-November 2008 (Austral Spring) and April-May 2010 (Austral Autumn). Cross-front sections carried out in the intense upwelling cell near 14°S provide information on the geostrophic transport variability. During the first mission, the glider completed nine consecutive sections of ∼100 km down to 200 m depth perpendicular to the continental slope, allowing to measure the equatorward surface jet. During the second one, six sections of ∼100 km down to 1000 m deep allow to characterize the deeper vertical structure of the current system. Estimates of alongshore absolute geostrophic velocities were inferred from the density field and the glider drift between two dives. An equatorward surface current with a maximum of 30 cm/s was identified as the Peru Chile Current and a subsurface poleward current with a maximum of 15 cm/s as the Peru Chile Undercurrent. In April-May 2010, a remarkable subsurface equatorward current of ∼ 10 cm/s was observed above the continental slope and between 250 and 1000 m deep. The coastal current system, more particularly the subsurface equatorward current, is tentatively linked to the signature of poleward propagating coastal trapped waves, as shown by regional model (ROMS) simulations.