



The formation of an anticyclonic mode water eddy within the Peru-Chile Undercurrent.

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The formation of an anticyclonic mode water eddy in Jan/Feb 2013 within the Peru-Chile Undercurrent is presented based on a multi-platform observational study. Two consecutive research cruises, a glider swarm experiment and moored measurements were conducted as part of the interdisciplinary "SFB 754 Climate-Biogeochemistry Interactions in the Tropical Ocean" project within the Peruvian upwelling regime at 12°S. The dataset allows a detailed investigation of the eddy generation process and its impacts on the near-coastal hydrography and biogeochemistry in space and time.

The near-coastal horizontal circulation off Peru at 12°S changes significantly over the two months of observation. In early January, we observe a strong but clear Peru-Chile Undercurrent with maximal pole-ward velocities of ~25 cm/s in 100 - 200 m depth. A week later the vertical shear starts to increase and finally a mode water eddy forms. The eddy has a velocity maximum of ~0.3 m/s in 100 - 200 m depth and a radius of ~45 km. The eddy induced circulation strongly influences the near-coastal hydrography: Across-shore velocities result in an exchange of water masses between the shelf-break and the offshore ocean. At the eddy edge small scale salinity anomalies are found, which seem to be formed by mesoscale stirring. Energetic near-inertial oscillations are observed in the deeper water column during eddy generation that appear to be associated with this feature. After its generation close to the shelf break the eddy propagates westwards.