Geophysical Research Abstracts
Vol. 17, EGU2015-9281, 2015
EGU General Assembly 2015

Nearshore transects of surface wind and wind stress in the Atlantic eastern boundary upwelling systems

Michael Schlundt, Marcus Dengler, Peter Brandt, and Karl Bumke
GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany (mschlundt@geomar.de)

The two large eastern boundary upwelling systems (EBUSs) in the Atlantic (Canary upwelling system and Benguela upwelling system) are both strikingly affected by the equatorward trades. The equatorward alongshore component of the wind stress leads to a coastal Ekman divergence, while a nearshore cyclonic wind stress curl results in Ekman suction. Therefore both processes are related to the upwelling and impact its intensity.
Several satellite radiometer and scatterometer products have been used for years to estimate the horizontal structures of wind speed, wind stress and wind stress curl in the EBUSs in order to relate them to upwelling intensity and ocean-atmosphere energy fluxes. But an investigation of well known features of the EBUSs, as strong wind gradients at sea surface temperature fronts or the drop off zone in wind speed near the coast, based on satellite observations is difficult, because satellite retrievals give actually no reliable estimates within 25 km from the shore due to land contamination.
Here we show a comparison of shipboard observations of wind speed, direction, and subsequently estimated stress and stress curl along transects close to the coast with available satellite observations for the period from 2000 until 2014. The data are from German and international research vessels which are frequently present in the near coastal region. Estimates of turbulent heat fluxes between the ocean and the atmosphere, strongly affected by the wind speed, are also given and compared with commonly used satellite products.