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## Southeast tropical Atlantic changing from subtropical to tropical conditions

**Marisa Roch**, Peter Brandt, and Sunke Schmidtko

GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany (mroch@geomar.de)

A warming and freshening trend of the mixed layer in the upper southeast tropical Atlantic Ocean (SETA) is observed by the Argo observation array during the time period of 2006 to 2019. Thus, the ocean surface density is reducing. This has an impact on the upper-ocean stratification which intensified by more than 30 % in the SETA region since 2006. The initial typical subtropical stratification with a salinity maximum at the surface is shifted to more tropical conditions characterized by warmer and fresher surface waters and a subsurface salinity maximum.

A more detailed analysis of isopycnals shows a continuous upward displacement of isopycnal surfaces suggesting that wind stress curl-driven upwelling has to play an essential role. Therefore, ASCAT wind stress changes are examined, revealing that increased open ocean wind curl-driven upwelling but also partly counteracting reduced coastal upwelling due to weakened alongshore southerly winds are present. Changing alongshore winds might be a reason why tropical surface waters spread further southward reaching more into the SETA region. Besides, atmospheric fluxes could further impact upper ocean characteristics.

Changes in the upper-ocean stratification matter as they affect not only physical ocean dynamics such as ocean ventilation processes but also biogeochemical and ecological activities such as nutrient fluxes and fisheries. Nevertheless, the consequences of increased stratification for upwelling regions are not yet fully understood. The SETA upwelling system is a key region for enhanced nutrient supply to the euphotic zone and hence, a core nutrient source for high coastal primary productivity.

We aim to assess the recent change of upper-ocean stratification towards tropical conditions at the sea surface in the SETA region and explore its driving mechanisms as well as possible consequences for the primary productivity and fisheries off Angola and Namibia, in order to improve our understanding of what is happening as a result of intensified upper-ocean stratification in upwelling regions.