



Generation of Tropical Instability Waves in the Atlantic Ocean

K. von Schuckmann (1), P. Brandt (2) and C. Eden (3)

(1) IFREMER, Brest, France (karina.von.schuckmann@ifremer.fr), (2) IFM-GEOMAR, Kiel, Germany

The spatial and temporal distributions of tropical instability waves (TIWs) in the Atlantic Ocean are investigated using a combination of current observations with moored instruments deployed at the equator at 23°W and a realistic eddy-resolving ($1/12^{\circ}$) general circulation model of the Atlantic Ocean. The meridional and vertical shears of the zonal current system contribute to the eddy production rates and thus to the generation of TIWs in the central tropical Atlantic Ocean. In the southern hemisphere, TIWs are forced only by baroclinic instability associated with the vertical shear of the central part of the South Equatorial Current (SEC). In the northern hemisphere, baroclinic instability due to the vertical shear of the northern SEC as well as barotropic instabilities due to horizontal shears of the Equatorial Undercurrent (EUC)/nSEC and nSEC/North Equatorial Countercurrent (NECC) contribute to the generation of the TIWs. Since seasonal changes of the instability production rates related to the EUC/nSEC are comparable low while the rates related to the nSEC/NECC are high, we suggest that the seasonality of the NECC dominates the seasonal modulation of the TIWs.