



## **Decadal changes in the North Atlantic subtropical gyre from 1980 to 2000**

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Twenty years of time series observations from the deep-sea mooring KIEL276 were used to study decadal changes in the North Atlantic subtropical gyre. The site is located at the 33°N, 22°W at about 5200 m depth, near the southern boundary of the Azores Current (AC) which is part of the North Atlantic subtropical gyre. The annual mean kinetic and eddy kinetic energies had moderately-high values in the early 1980s, low values during most of the second half of the 1980s, high values during the first half of the 1990s and, after a short decrease, high values later in the 1990s. A conceptual model is used to identify AC meanders in the upper layer time series. The AC axis appears to have been closer to the site during the 1990s than during the preceding decade and indicates a southward or southwestward displacement of the AC. This position change is correlated with variations in the North Atlantic Oscillation (NAO) index. It is conceivable that NAO forcing either changes the transports in the subtropical gyre, resulting in a variation of the Azores Current transports, or causes a displacement of the subtropical gyre, or both. Curry and McCartney (2001) demonstrated that the baroclinic mass transport, obtained from potential energy anomalies between the Labrador Sea and Bermuda, appears to be correlated with the NAO index. This suggested gyre transport changes that are related to NAO atmospheric pressure changes. Our results indicate gyre displacements which appear correlated with the NAO. We conclude that the NAO forcing affects both the magnitude of gyre transport and the position of the northeastern part of the gyre, with a lag in oceanic response of about three years. Such a delay agrees well with model results (Eden and Jung, 2001) that suggested a lag of three to five years of the baroclinic ocean response to the atmospheric NAO signal.