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Atmospheric modes influence on Sea Surface Temperature variability along the northwestern coast of the Iberian Peninsula from 1985 to 2006.

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The influence of the atmospheric forcing on the inter-annual variability of the sea surface temperature (SST) was analyzed along the northwestern coast of the Iberian Peninsula (IP) (40º- 43ºN, 6º- 8ºW). The January Sea Surface Temperature (J SST) was obtained from the advanced very high resolution radiometer (AVHRR) NOAA satellite from 1985 to 2006. The dependence of J SST on the most representative regional patterns with some influence upon the eastern North Atlantic region was analyzed by means of correlations between November- December atmospheric modes and J SST. These circulation patterns have the amplitude more pronounced during winter and they are: the North Atlantic Oscillation pattern (NAO), the Eastern Atlantic pattern (EA), the Eastern Atlantic Western Russia pattern (EA/WR), the Polar/Eurasia pattern (POL) and the Scandinavia pattern (SCA). The analysis reveals that two atmospheric patterns (N-D NAO and N-D EA/WR) are responsible of the main variability of the J SST of the western and northern IP. J SST is negatively correlated with N-D NAO and positively correlated with N-D EA/WR. This correlation is only restricted to the region close to the continental margin as proved by the fact that no significant correlation was found between atmospheric indices and oceanic SST. Multivariate analysis involving both modes provides correlation coefficients on the order of 0.7 on both coasts (western and northern). The influence of both modes on J SST was observed to be on the same order of magnitude but with different sign. These correlations were physically interpreted by means of an analysis of extreme events and Sea Level Pressure (SLP) composite analysis.