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Interannual to Decadal Variations of Sea Level at Brest Induced by the Atmospheric Circulation over the Eastern North Atlantic

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The winter-mean sea level heights at Brest, France, reveal a strong correlation with precipitations in the western part of the Iberian peninsula. We suppose that the physical mechanism behind this correlation is linked to the large scale atmospheric circulation in the North Atlantic which is known (Zorita et al, 1992) to be responsible for the dominant part of the western Iberian rainfall. Using the methods of canonical correlation analysis, we identify a pair of highly correlated patterns in the North Atlantic sea level pressure (SLP) anomaly and in the Iberian precipitation. The time-dependent amplitude of the SLP pattern is then compared to the sea level heights at Brest tidal station. The Singular Spectrum Analysis (SSA) and the wavelet decomposition confirm that the winter sea level variability at Brest in the 2-4 year band and a significant part of its decadal variations are due to the large-scale modes of the atmospheric circulation in the eastern North Atlantic which are also responsible for the enhanced rainfall in the western Iberia.