



Coherent coupled modes of interaction large-scale atmospheric circulation-iberian wind

ANA Morata (1), M.L Martín (2), M.Y Luna (1), A. Pascual (3), and F. Valero (3)

(1) Agencia Estatal de Meteorología. Leonardo Prieto Castro, 8. 28040 Madrid. Spain. email: abmorata@inm.es), (2) Escuela Universitaria de Informática de Segovia. Universidad de Valladolid. Pza. Sta. Eulalia, 9-11, 40005 Segovia. Spain, (3) 3Dpto.Ciencias de la Atmósfera. Facultad CC. Físicas. Universidad Complutense de Madrid. Ciudad Universitaria s/n. 28040 Madrid. Spain

The relationship between the monthly mean sea level pressure and the wintertime (December-January) Iberian monthly mean wind is determined by means of a Canonical Correlation Analysis (CCA) from 22-winter (1980-2001). The CCA yields three coherent modes, assessing the dynamical relationship between the North Atlantic atmospheric circulation and the wintertime Western Mediterranean wind. The first large-scale canonical pattern, with a correlation value of 0.81, establishes a clear relationship between the sea level pressure and the North Atlantic Oscillation (NAO) patterns, resembling a configuration with the positive zone over the northern area of study and the negative one located near Canary Islands, respectively. This large-scale atmospheric distribution promotes air western advection over the Iberian Peninsula favouring a wind configuration that presents similar behaviour over all study area. These results indicate that the first mode would explain the inverse response of the study area to the NAO pattern, that is, an intensification (weakening) of the winter NAO index is linked with positive (negative) wind anomalies over Iberia. The second canonical large-scale mode ($r = 0.64$) indicates that above-normal wind values are determined by the presence of a long-lived atmospheric blocking pattern characterised by high correlation absolute values over Iberia. This large-scale pattern correlates with a west-east canonical wind pattern with remarkable correlation positive values over the eastern Iberia and negative ones over the western peninsular area.