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## Regional winds over the Iberian Peninsula (Cierzo, Levante and Poniente) from high resolution COSMO-REA6 reanalysis

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Regional winds are usually caused by small pressure differences, and so air flows arise in very specific areas. When these air flows pass through certain orographic features over the Iberian Peninsula, such as channels like the Ebro Valley or the Strait of Gibraltar, they acquire a certain range of directions and considerable speed due to mass conservation. However, reanalysis products are not able to analyze them because their spatial resolution, larger than 10 km, is usually not high enough to properly describe the orographic characteristics that lead to these regional winds. Here, we explore the application of the COSMO-REA6 very high resolution reanalysis system to study three regional winds in the Iberian Peninsula: Cierzo in the Ebro Valley and Levante and Poniente in the Strait of Gibraltar, for the 2000-2018 period. COSMO-REA6 has a spatial resolution of 6 km (0.055°), much larger than the other current state-of-the-art reanalysis, and so it could better capture regional winds due to its better orographic representation. Cierzo, Levante and Poniente are very relevant due to their intensity and frequency over the regions. Defined with a 5 m/s threshold for each hour and their specific direction range, around 95, 85 and 82 wind days per year are obtained, respectively. Comparison against the small amount of observational data shows that there is reasonable conformity between datasets in terms of statistics and annual cycles. Reanalysis allows us to study regional wind spatial features such as extension statistics (frequency, covered area) of Cierzo along the Ebro Valley or Levante/Poniente over the Strait of Gibraltar. Atmospheric patterns associated with these regional winds indicate great differences between winter and summer patterns. This study aims to increase the current small number of studies focused on regional winds over Europe, with clear interests on wind climatology, meteorological characterization of atmospheric flows and other applications such as renewable energy production.