

Regional winds over the Iberian Peninsula with COSMO-REA6 high resolution regional reanalysis: Cierzo, Levante and Poniente

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1. Introduction
REGIONAL WINDS (SMALL-SCALE): HIGH RESOLUTION NEEDS FOR ITS STUDY
BY REANALYSIS AND MODELS
COSMO-REA6 HIGH RESOLUTION REANALYSIS

2. Objective
1) Characterize Cierzo, Levante and Poniente as seen from COSMO-REA6, 2000-2018 period; 2) Study their weather regimes.

3. Methods
1. Proposal of **objective regional wind definitions**
Cierzo: 285°-315° (west-northwest), > 5.6 m/s
Levante: 75°-105° (east), > 5.0 m/s
Poniente: 255°-285° (west), > 5.0 m/s
2. **Regional wind days calculation (> 6 h wind under conditions / day)** according to HadISD observations and COSMO-REA6
3. **Regional wind characterization**
4. **Weather Regimes: EOF analysis + k-means clustering**

4. Results

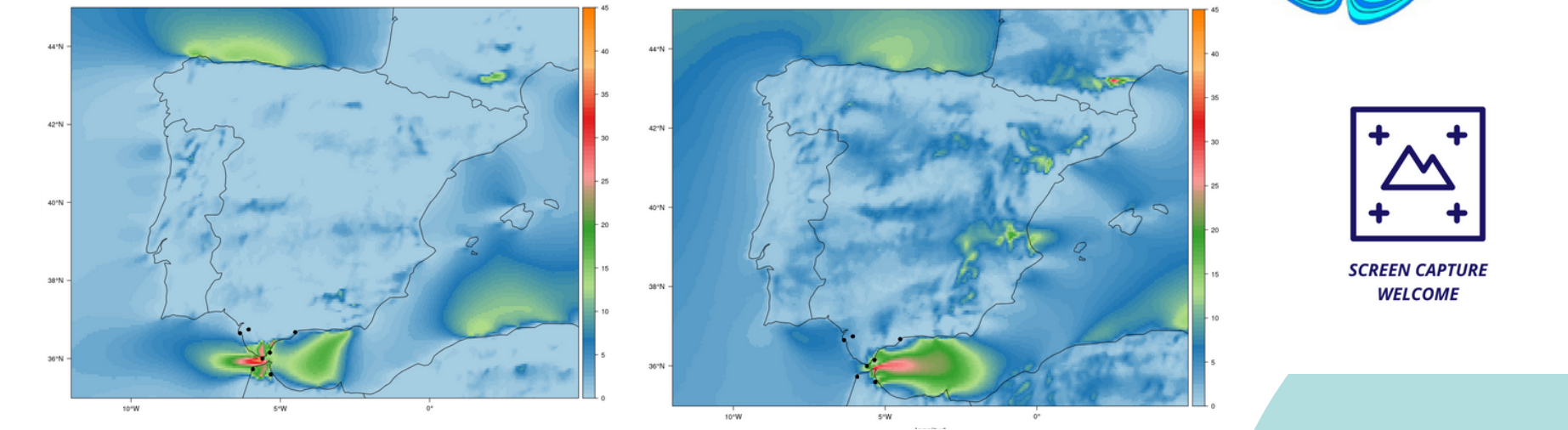


Figure 1. Percentage of Levante (left) and Poniente (right) hours in a year in 2000-2018 according to COSMO-REA6. Black dots mark HadISD weather stations

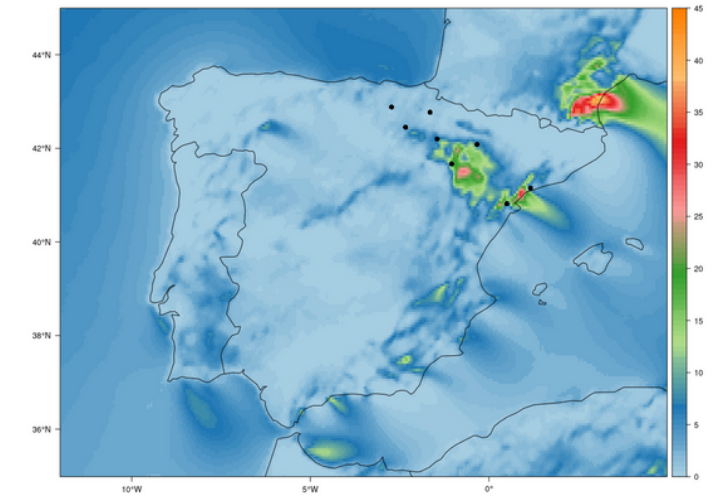


Figure 2. Percentage of Cierzo hours in a year in 2000-2018 according to COSMO-REA6. Black dots mark HadISD weather stations

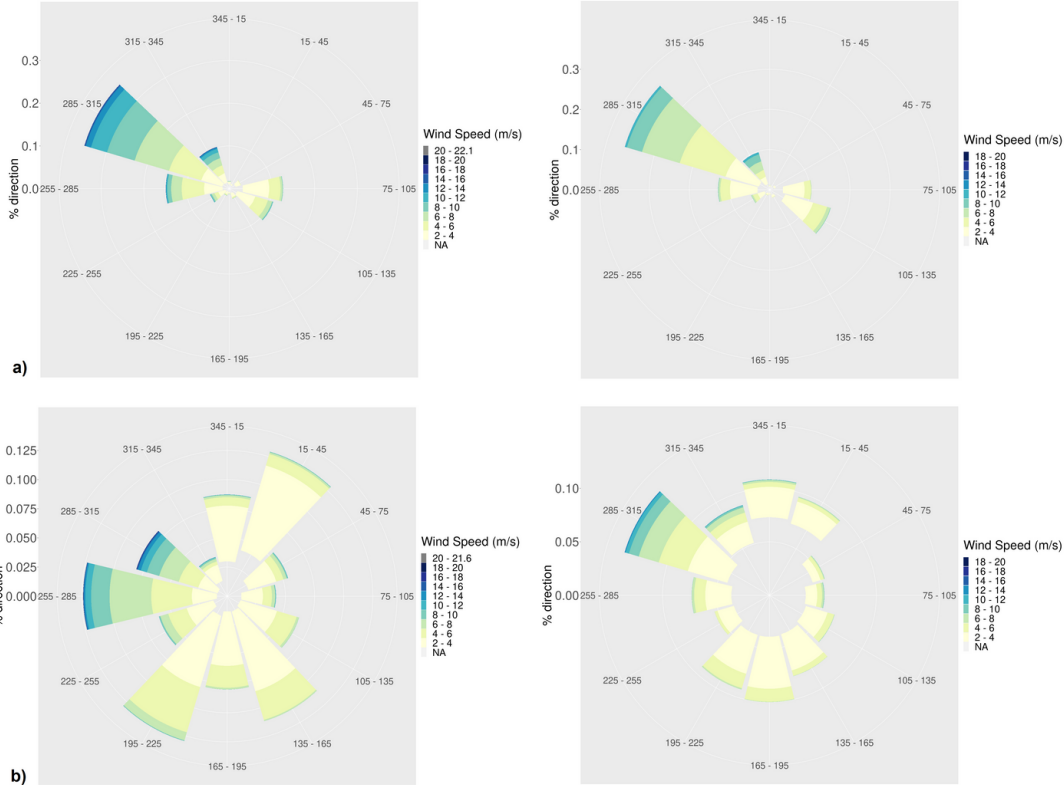


Figure 3. Wind roses from hourly data (2000-2018) of weather stations from Ebro Valley according to HadISD (left) and COSMO-REA6 (right): a) Zaragoza, b) Reus

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4. Results: Weather Regimes

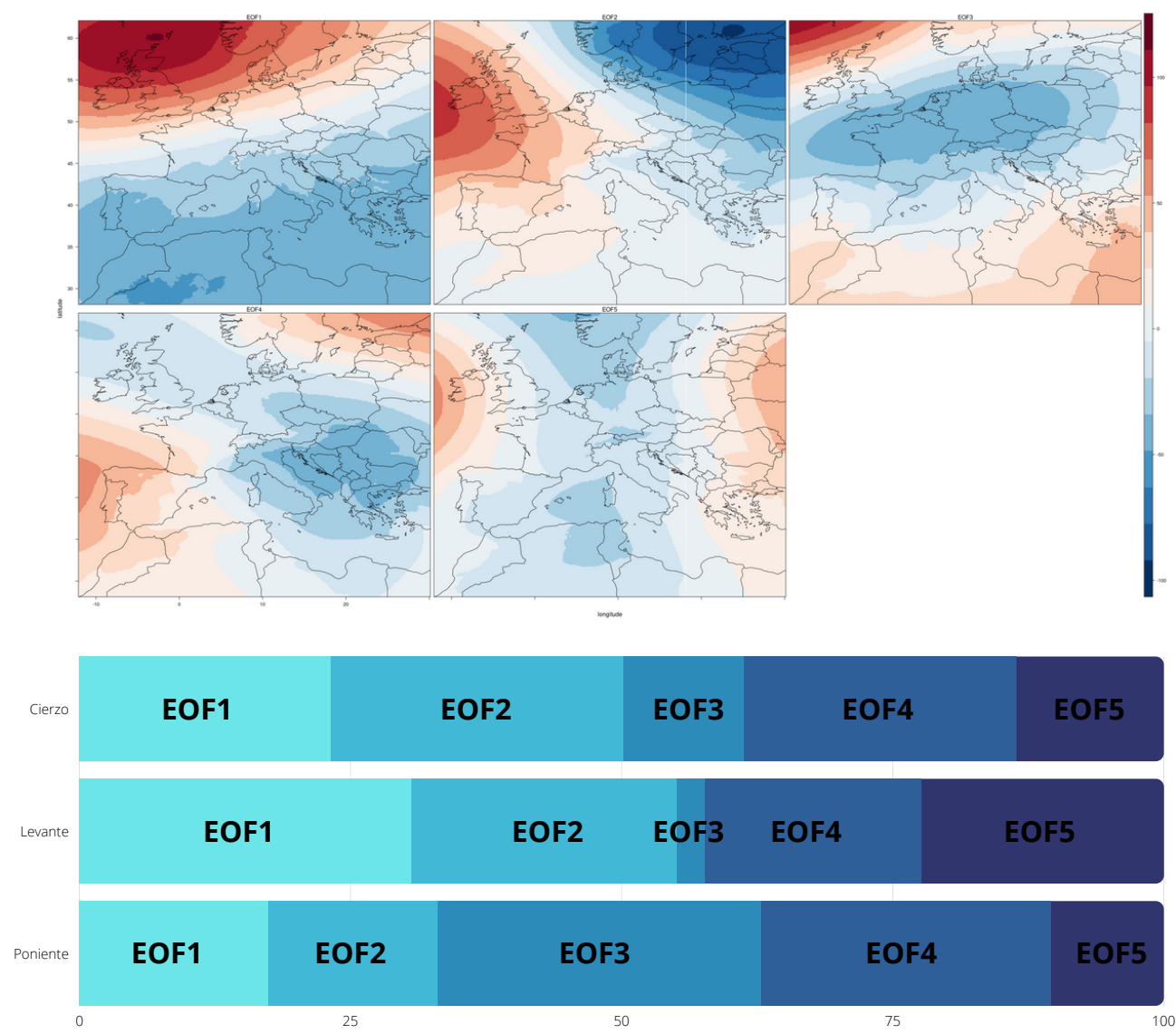


Figure 4. Annual weather regimes (2000-2018) and regional wind days distribution

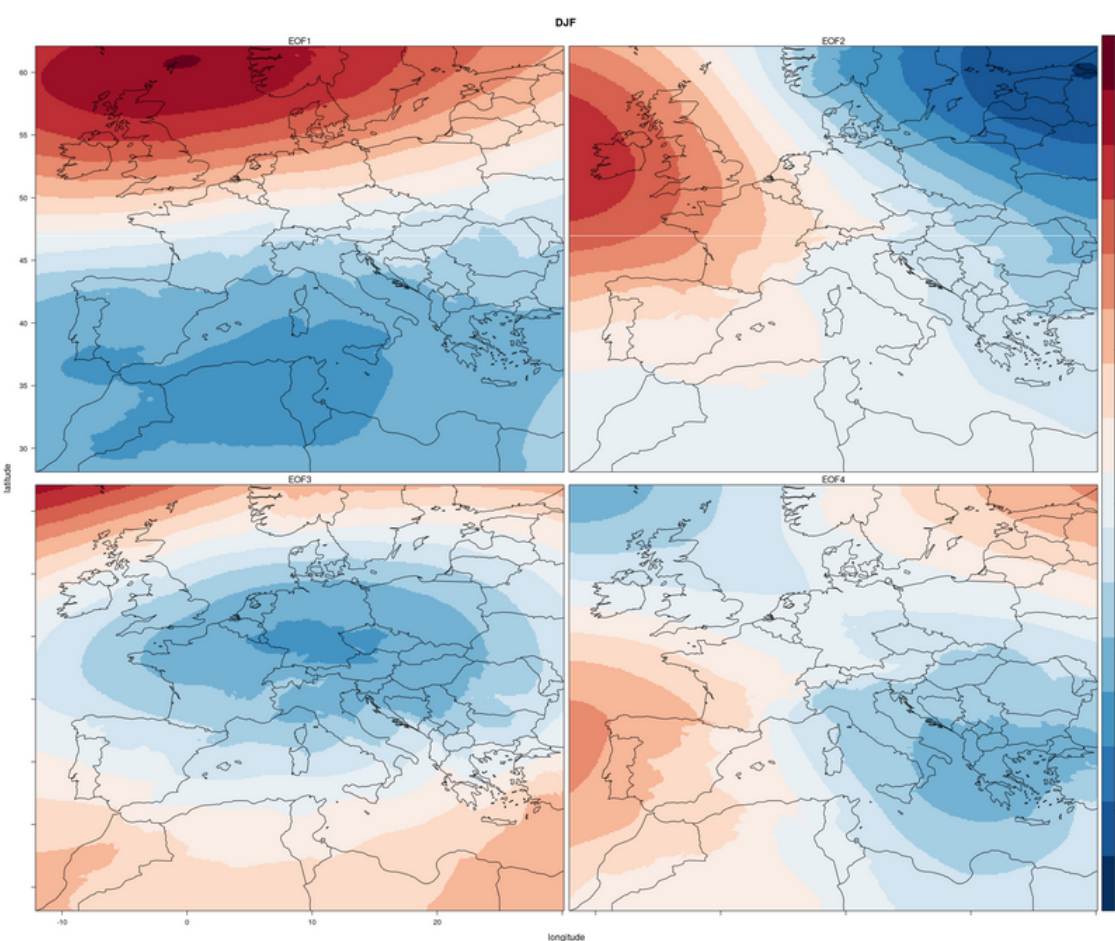


Figure 5. Winter (DJF) weather regimes (2000-2018)

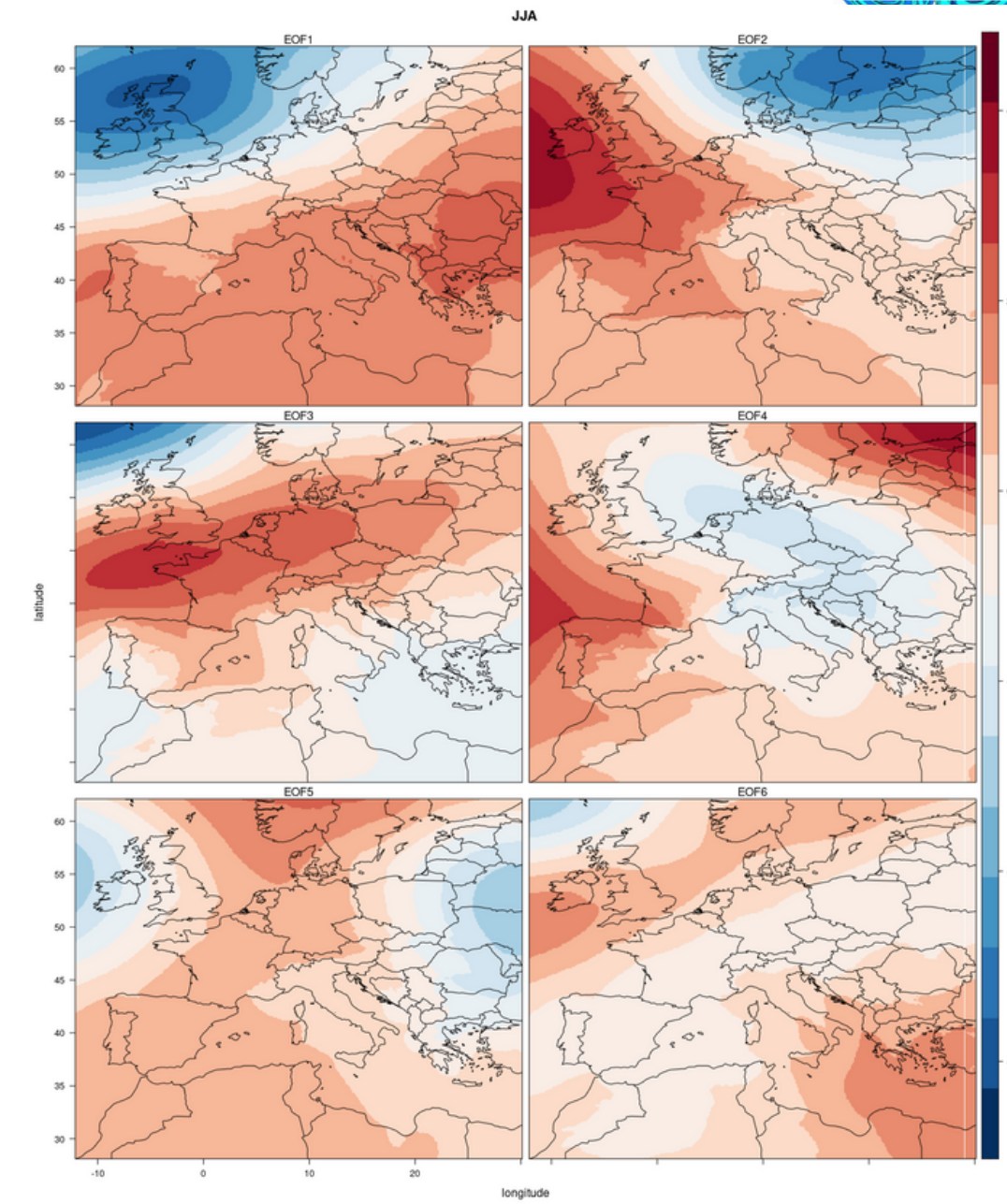


Figure 6. Summer (JJA) weather regimes (2000-2018)

COSMO-REA6 represents well mean sea level pressure conditions of regional winds, but seems to underestimate the mean wind in some areas.