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Near-surface wind pattern in regional climate projections over the broader Adriatic region

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The Adriatic region is characterized by the complex coastline, strong topographic gradients and specific wind regimes. This represents excellent test area for the latest generation of the regional climate models (RCMs) applied over the European domain. The most famous wind along the Adriatic coast is bora, which due to its strength, has a strong impact on all types of human activities in the Adriatic region. The typical bora wind is a severe gusty downslope flow perpendicular to the mountains. Besides bora, in the Adriatic region, typical winds are sirocco (mostly during the wintertime) and sea/land breezes (dominantly in the warm part of the year) as a part of the regional Mediterranean wind system. Thus, it is substantial to determine future changes in the wind filed characteristics (e.g., changes in strength and frequencies). The first step was the evaluation of a suite of ten EURO- and MED-CORDEX models (at 50 km and 12.5 km resolution), and two additional high resolution models from the Swiss Federal Institute of Technology in Zürich (ETHZ, at 12.5 km and 2.2. km resolution) in the present climate. These results provided a basis for the next step where wind field features, in an ensemble of RCMs forced by global climate models (GCMs) in historical and future runs are examined. Our aim is to determine the influence of the particular combination of RCMs and GCMs, horizontal resolution and emission scenario on the future changes in the near-surface wind field. The analysis reveals strong sensitivity of the simulated wind flow and its statistics to both season and location analyzed, to the horizontal resolution of the RCM and on the choice of the particular GCM that provides boundary conditions.