



Moisture recycling and the maximum of precipitation in the spring in the Iberian Peninsula

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We investigate here the intensity of land-atmosphere coupling over the Iberian Peninsula. We conducted paired, high-resolution simulations with the WRF-ARW model, using a nested grid that covers the Iberian Peninsula with 5km horizontal resolution. We selected ten months of May (May 2000 to May 2009) and ten months of January (January 2000 to January 2009). For each month, two simulations were performed: one where all land-atmosphere feedbacks were taken into account and an experiment where infiltration of the precipitated water into the soil was suppressed. From the difference of rainfall in both simulations, we compute the recycling ratio. A mean recycling ratio of 7.3% was obtained for the whole Iberian Peninsula in May. This value decreases to 4.4% in January. In the spring, the mean recycling ratio is above 15% in the driest areas of the Iberian Peninsula: the Southern Plateau, Centre and Levante region. This suggests that the maximum of precipitation taking place in May inland Iberia is related to the enhancement of land-atmosphere water fluxes in spring. Water recycling seems to be a key factor in extending convective precipitation for several days in this season. The amount of recycled water is of the same order as changes in precipitation expected as a consequence of climate change in the Iberian Peninsula. A better understanding of land-air interactions in such water-limited region is therefore very relevant to assess the impact of future climate change scenarios in the regional hydrologic cycle.