

## ***Interactive comment on “A regional climate simulation over the Iberian Peninsula for the last millennium” by J. J. Gómez-Navarro et al.***

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We thank the reviewer for his/her detailed comments on the manuscript. He/she has a general concern about the use of the model ECHO-G to drive the regional climate model over the Iberian Peninsula. In addition, he/she provides us with a list of particular points that should be improved in a revised version. We basically agree with the particular comments. Here we would like to address the more general comment on the global model ECHO-G. The model ECHO-G is included in the model suite of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. It has relatively low-resolution atmosphere (horizontally about 3.75x3.75 degrees) compared to the resolution of other IPCC models like ECHAM5-OM (1.87x1.87 degrees) or HadCM3 (2.75x3.75 degrees). The reviewer points out that the atmospheric circulation

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over the North Atlantic in ECHO-G tends to be too zonal. This is indeed a drawback that is shared to a varying degree by other IPCC models. However, assessments of the quality of the IPCC models measured by their skill to simulate the present observed climatology rank ECHO-G as one of the best IPCC models. Specifically, for the extratropical Northern Hemisphere atmospheric circulation, the study by Glecker et al (2008) place ECHO-G as the 3rd best model within the IPCC model suite. In terms of simulated precipitation ECHO-G ranks as the best 7th model, despite its coarser resolution (see Figure 1). An important advantage of ECHO-G for paleoclimate simulations is the high computational throughput, which allows to complete long simulations. Millennial simulations with IPCC global models are still relatively scarce. To our knowledge only three models have been used to simulate the global climate of the past millennium: in addition to ECHO-G, ECHAM5-OM (T30 low resolution version), IPSL and NCAR-CCSM. Shorter simulations covering the past 500 years have been also conducted with UKMO-HadCM3 and with the Bjerknes Centre BCM model.

All models can be improved, and in particular a realistic representation of the solar and volcanic forcing probably requires a more highly resolved lower stratosphere than is presently the case in most IPCC models. However, despite the existing biases with respect to the observed climatology, we think there is no objective reason not to use the model ECHO-G, among the existing models, for paleoclimate simulations of the past millennium.

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Interactive comment on Clim. Past Discuss., 6, 2071, 2010.

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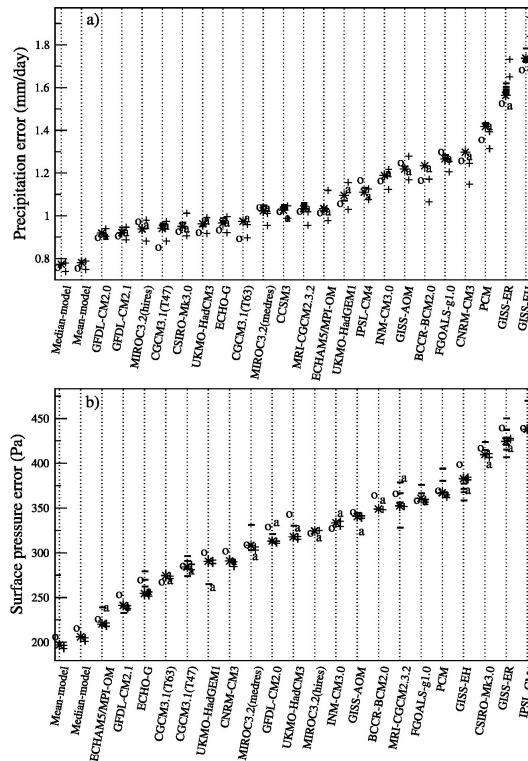
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**Figure 6.** Model RMS errors in the Northern Hemisphere extra-tropics (20N–90N) for (a) precipitation and (b) mean sea level pressure. The sensitivity to different analysis choices are shown by use of different symbols: standard choice (\*), alternate reference data set (o), different climatological averaging period (a), target grid at different resolutions (+), and alternate ensemble members (—). The models are ordered according to the errors calculated with the standard analysis procedure.

**Fig. 1.** From Glecker et al., Performance metrics for climate models. J. Geophys. Res. 113, D06104, doi:10.1029/2007JD008972, 2008

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