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Interactive Comment

Interactive comment on "Regional climate modeling on European scales: a joint standard evaluation of the EURO-CORDEX RCM ensemble" *by* S. Kotlarski et al.

Anonymous Referee #2

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1. General comments This paper shows us the preliminary results of EURO-CORDEX project, which is the revised version of the pioneering project, EU-ENSEMBLES, by using higher resolution regional climate models. All the results written in the paper does not conflict with the results of all the existent research of dynamical down-scaling. It looks like a well written report of the experiment, but it is hard for us to find scientifically new thing in the paper. In the paper, they validate the results of many models nesting to ERA-Interim, but there is no explanation of the characteristics of ERA-Interim itself. We can easily find that the parent GCM had great influence on the calculation results of RCM. Thus, we would like to know the systematic bias appeared in ERA-Interim, before discussing the results of down-scaling results. For the same reason, we also would

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like to know the character of ERA40, compared to ERA-Interim, because it would affect the difference between 0.22 degree grid RCM used in EU-ENSEMBLES and 0.11 – 0.44 degree grid RCM used in this paper. 2. Specific comments (1) In this paper, they validate the data in monthly to seasonal time scale and 8 sub-domains in Europe, and could not find the advantage of using high resolution RCMs. Our impression is that the validation time-scale and space-scale is too coarse to find the advantage of high resolution models. As written in Kanamitsu and DeHaan (2011), effect of the higher resolution would appear in a specific region. Thus we should adopt a metric which could find such localized effect. In this paper, they avoid the difference of resolution in both observed data and model data, by smoothing the higher resolution data. But could we really compare such different comparison data in the same Taylor-diagram? (2) In this paper, we could not find any rationality in the selection of 8 sub-domains. It is hard to agree that 8 sub-domains are selected only because "following to PRUDENCE". As they introduce, for AL (alpine) region, there are two quite different climate sectors, one the Alpine mountainous region and other the mount foot plane region, which makes it difficult to analyze the result around there. (3) In this paper, they validate 2m temperature and precipitation, because they are "two main parameters required by climate impact modelers". However for agricultural impact modelers, they need also humidity and downward short wave radiation data to drive their crop yielding model (Iizumi et al., 2012). For hydrologist, they also need downward short wave radiation to estimate water budget in some water basins. They need to focus on target, before selecting both the parameter and metrics. (4) They insist on the effect of topography for the added value in RCMs. However, in the discussion, there is nothing said about the envelope mountain. We understand that in some RCM, they adopt envelope mountains and the precipitation pattern look much coarser than the resolution of the model itself (Fig. 1 of Ishizaki et al., 2012). They had better comment on that thing in the paper, too. (5) They comment on the under-catchment of the rain gauge in the paper. We understand that it is a severe issue when we validate the precipitation data with the observation. However, the rate of catchment becomes quite different when the precipitation is rain or snow. In snow case, sometimes the catchment is only around 50%. Thus they need to analyze much more carefully if they think it is a serious issues. References Iizumi, T., et al., 2012: ELPIS-JP. A dataset of local-scale daily climate change scenarios for Japan., Pjil. Trans R. Soc.A 370, 1121-1139. Ishizaki, N. N. et al., 2012: Improved performance of simulated Japanese climate with a multi-model ensemble, J. Meteor. Soc. Japan, 90, 235-254. Kanamitsu, M., and L. DeHaan, 2011: The added value index: A new metric to quantify the added value of regional models, J. Geophys. Res., 116, D11106.

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