Nat. Hazards Earth Syst. Sci. Discuss., 1, C1665–C1667, 2013
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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Spatial and temporal patterns of recent and future climate extremes in the Eastern Mediterranean and Middle East region" *by* E. Kostopoulou et al.

Anonymous Referee #1

Received and published: 11 November 2013

The manuscript "Spatial and temporal patterns of recent Atmospheric Measurement and future climate extremes in the Eastern Mediterranean and Middle East region" by Kostopoulou et al. is mainly focused on a standard analysis of temperature and precipitation simulated by a regional climate model. The manuscript lacks of clarity and should be carefully revised. Many sentences/paragraphs should be supported by appropriate references (see the specific comments). The applied methods are not well explained and there are some technical issues, e.g. on the estimated seasonal cycles and on the model evaluation w.r.t observations. Concerning the latter, there are not enough details to properly evaluate what has been done by the authors. As for the

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results, the authors should give information for all seasons and provide the significance of all results. Since the analysis is standard and computationally inexpensive, the authors should take care of all details. Finally, the aim of the manuscript is not really clear. What do the authors want to prove with the trend analysis of the two periods? Is a trend analysis of two separate periods able to reveal interesting and interpretable results? What about potential changes in seasonal precipitation/mean temperature?

Some specific comments

4427, 1-2: Please add a reference. 4427, 5: Please add a reference. 4427, 5: I suggest to delete "even local conditions", or at least specify that "local" refers to a spatial scale of $\sim$10 km. 4427, 11: Please add a reference. 4427-4428, 23-14: The authors should add and use the following reference (and references therein) to give a proper description of what has been done for the Mediterranean region (especially for the western-central part of the basin): "The Climate of the Mediterranean Region: from the past to the future" Lionello eds. 2012. 4428, 24-26: The sentence is questionable. RCMs cannot replace observations. 4428, 26: Please do not use acronym without providing the full name. Please add a reference both for the project and the model. 4429, 5-10: Please rephrase. 4429, 23: "This study". 4430, 3-6: Please move this link at the line where CIMME project has been introduced for the first time. 4430, 10: Please add a reference, and provide complete information. Different CRU datasets exist. 4430, 19: Please provide complete information and add the appropriate references. Linear model is not enough. 4430, 23: Please provide a list of the calculated extremes with detailed information. If the work of the CLIVAR Expert Team on Climate Change Detection and Indices has been used, please cite the associated reference. 4430, 24: Please give a detailed description. Linear regression is not enough. 4431, 3: Please explain how the bias has been evaluated. Concerning daily precipitation, what do the authors want to show/prove? Please note that modeled precipitation is an "areal" variable and that daily precipitation has a distribution with right-skewness and exponential/heavy tail. 4431, 5: The authors cannot conclude that the model has a cold bias based on the evaluation

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on 14 stations (the details of the evaluation are not provided). 4431, 6-8: As far as I understood, the RCM has been driven by HadCM3P, so a correlation analysis of daily time series is not informative. 4431, 9-10: The seasonal cycle of temperature has to be calculated by using time-window (3-5 days) centered on the calendar day. Then, the output has to be smoothed by using for instance splines. Concerning precipitation, please use a smoothing algorithm. 4432, 1: Please clarify the meaning of "diverging". 4432, 8: Please replace "may reach as" with "reach values as" 4432, 16: "Mann-Kendall test". Please add the associated reference and move this part to the section on the methods. 4432, 17: Which significance level has been used? 4432, 18-25: What about the other season? The lack of significant trend for summer TX in many areas is surprising and does not match with the signal identified in many instrumental time series from the station located over the Mediterranean region. I think the authors should discuss this point. 4433, 4-9: This paragraph is not in the correct section. 4433, 10: "of the mean of the selected indices". 4433, 12: Please delete "can". 4433, 15: This is simply an effect of the absolute threshold. 4434, 20: What about the significance of the identified differences? Figures 1-4-6: Please revise the caption.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 4425, 2013.