

Interactive comment on “Palaeostages of the Caspian Sea as a set of regional benchmark tests for the evaluation of climate model simulations” by A. Kislov et al.

A. Kislov et al.

avkislov@mail.ru

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We are grateful to Dr. Ramstein for his valuable comments and stimulating recommendations how to improve this paper. But we believe that current manuscript and recommendation about its refocusing are two completely different things. The most severe criticism is focused on two points. First is that we use only few models to validate the CMIP/PMIP over the Caspian Sea water balance. Concerning this point, please note that the paper had been submitted several months before the publication of the last review. Nevertheless, by the moment of paper submission the CMIP5 archive contained only the three models that were used in the paper. We believe that the paper

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should account for the state-of-art by the moment of its submission to a journal. Nevertheless, we will definitely consider the recent infilling of the CMIP5 archive in further publications. The second major point of criticism is that the level of the Caspian Sea (CS) is not enough accurately defined and reliable in chronology and amplitude to be used as a benchmark. We can not object to that given that we show in the paper that no single curve of the CS level change exist which could be taken in the form (date; stage) for direct testing of climate models. However we show (Section 4, Table 1) that, in terms of relative time, the succession of high and low stages is well established and demonstrates remarkably high amplitude of level changes, which is illustrative of high changes of water balance components. We show then (Section 6) that the CS water balance during MIS 2 – MIS 3 was governed rather by climate changes than by glacial melting or any other factors. The main idea of the paper is the suggestion to account for these high amplitude level changes of CS in the second half of the Late Pleistocene as a tool for evaluation of climate models. We find it reasonable because: (1) CS is the unique object in terms of integrating water balance of a vast enough territory appropriate to current spatial scales of global climate modeling; (2) CS level oscillations are high enough to be reproduced by models, and missing level variations of comparable period and amplitude may point at model unreliability at least in reproduction of water balance components. This will require producing of continuous time series through MIS 1 – MIS 2, which fits the suite of long-term simulations included into the CMIP5 experiment design (Taylor et al., 2012). As no appropriate long-term simulations has been reported yet, we focused in the paper on decadal-scale variations and showed that modern variations of water balance are not properly reproduced. We may also say that centennial-scale and longer variations characteristic for the Holocene and earlier epochs are also probable not to be reproduced well as it require some external stimulation which mechanism is not clear. Changing freshwater balance due to river rerouting in glacial epochs as suggested in (Alkama, 2006, 2008) should be tested as one of governing factors. We admit that the above message has not been reported clearly in the current version of the paper, therefore the conclusion section and the abstract re-

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quire reworking according to the explanations above. Some specifications are needed within the text to fit the reviewer's comments. Paying respect to the reviewer's suggestion, we propose the new version of the paper title: "Palaeostages of the Caspian Sea as a potential evaluation tool for climate model simulations".

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