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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Sensitivities of the MJO Forecasts on Configurations of Physics in the ECMWF Global Model" *by* Jun-Ichi Yano and Nils P. Wedi

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The two referees' reports are strongly critical of this paper primarily on the basis of the lack of clarity of the description of the approach taken, of the scientific questions being addressed and of the logical arguments that are required to use the simulation results to answer the scientific questions.

The authors made a reply in the on-line discussion to one of the referee reports. (The second report was posted two weeks later.) This reply began by emphasising the explorative nature of the paper and later gave a statement of the rationale for the paper – that the set of simulations and the results from them was a potentially valuable re-

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Discussion paper

source for researchers. That is a noble rationale, but it does require the authors to think clearly about how their results – which, I think it is fair to say, do not lead to any straightforward constraints on theoretical interpretation of the MJO and associated processes and mechanisms, can be presented in a way that will be genuinely useful to other scientists working on this problem.

Perhaps the paper needs a frank statement that no simple theoretical interpretation of the results has been possible. The statement is made in the abstract that 'A motivation behind this study is to explore a possibility of interpreting the MJO as a nonlinear free wave under active interactions with Rossby waves from and to higher latitudes'. Perhaps that is confusing in itself – because the reader may think that some progress on this must have been achieved – when in fact it has not.

Looking at the Discussion section of the paper it is very difficult to extract any firm conclusions. Do the first two paragraphs leave open the possibility that the free nonlinear Rossby-wave theory is viable? Or not? Does a later paragraph support the idea that taking account of interactions with extratropical waves may improve predictability? Or not? There are some very general statements about the subtleties of switching different processes on or off and interpreting the results. But it didn't require the results presented from this paper to establish that.

The reply also asked the referee for more specific details of the extra information requested in their report. My comment on this is that both referees have found it very difficult to follow the arguments presented in the paper. When I am in this situation myself as a referee I sometimes feel that I can give a rather specific set of instructions to the authors. ('If you clarify points A, B , C and D then the paper will be suitable for publication.') But other times it is not at all straightforward to do that – in such a case all one can do is report that one has found the paper unclear in various aspects and then put the onus on the authors to resolve this. I think that in this case the authors simply have to look at the paper again and consider how they might get over their arguments more clearly. [The reply requests further information on references – it was not difficult

to find these – see list at end of this comment.]

My overall view as Editor at this stage is that very significant revision will be required in order to bring this paper to a form suitable for publication in ACP. The MJO is of course a very important and challenging topic and the kinds of experiments that the authors report are not straightforward (and for many researchers are out of reach). Therefore the authors' wish that their results should be on record so to allow others to benefit from them is not an unreasonable justification for publication. But my impression from the two referees' reports is that the paper in its current state is not useful – there is little likely benefit to other scientists wanting to make progress in this field. The authors have to consider carefully what information and accompanying discussion is needed in the paper to improve that situation.

The authors have asked for extensions of the deadline for revision of their paper because of disruption to their work due to the covid-19 pandemic. My advice (offered late, but with the partial excuse of the same disruption) is, given the substantial revision that will be required, the authors do not proceed with revision of the paper, but instead spend some time considering carefully how their work can be presented in a way that will be genuinely useful to others and after that, if appropriate, make a new submission.

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