

Interactive
Comment

Interactive comment on “Impact of the sea surface temperature forcing on hindcasts of Madden-Julian Oscillation events using the ECMWF model” by E. de Boisséson et al.

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General comments

This article addresses the sensitivity of the MJO model forecast to different SST products. The Maiden Julian Oscillation is an intraseasonal oscillation, representing a important mode of variability in the tropics. Its mechanism is still not fully understood. The role of the ocean in the MJO is an open question: does it just responding to the atmospheric forcing or does it actively contributes to the MJO. A large panel of experiments using different SST products to force the ECMWF atmospherical model is presented. It allows testing the MJO forecast sensitivity to different parameters. A new observation

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based SST product, OSTIA, is tested.

A weakness of the paper is the lack of a clear description of the context as well as a clear physical description of the hypothesis tested in this study. The experiments done can be more “valorize” given more physical interpretation of the results.

The experiments themselves are well described and results clearly presented. The ability of the different experiments to predict the MJO is tested against the ERA Interim reanalysis, using an EOF decomposition. The large span of simulations allows exploring the impact of parameters such as the temporal resolution and phase relationship of the SST and OLR on the MJO forecast over 32 days. This paper is relevant for the special issue of OS on “Earth Observation for Ocean-Atmosphere Interactions Science”. It clearly shows high sensitivity of the MJO prediction to the SST and the need of a high frequency SST forcing to reproduce MJO events. The robustness of the result is tested with different winter conditions. It also shows the importance of a correct phase relationship between the SST and the atmospheric model. The consistency between atmospheric model initial conditions and SST forcing appears to be important. More emphasis on the potential role of the ocean and underlying assumption tested in this study could be interesting.

Specific comments

The title reflects the paper content and the abstract gives a clear summary of the paper. Introduction: More physical insights could be given to justify the study and set it in the current research context. It also should replace the numerical experiments in this context and expose the possible limitation of the study. For example, it will help justify the choice of 32day long experiment, explain the physical links and then phase relationship between the wind, SST, OLR and convection.

Model: How “realistic” is the ERAi reanalysis in terms of reproducing the MJO (propagation and intensity) as it use as reference to evaluate the different experiments presented in the paper?

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Experiment settings: The citation of the IFS cycle (36R4) is useless unless explained or referenced. As the Ocean Science journal readers can be not so familiar with specifically related vocabulary to atmosphere, a particular attention should be given to reduce the number of acronym and specific terms, like ISV, even if they are once defined.

A short physical interpretation of the first 2 EOFs could be helpful for a better understanding of what physic is represented or not with such criteria used to validate the simulations.

Technical corrections

Typing errors:

- L14 p2536: respect - L1 p2537: difficult - L24 p2544: experiments.

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