

## ***Interactive comment on “The Indian Summer Monsoon in MetUM-GOML2.0: Effects of air-sea coupling and resolution” by Simon C. Peatman and Nicholas P. Klingaman***

### **Anonymous Referee #1**

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This manuscript presents a study of the representation of the Indian monsoon using an atmospheric model coupled with a versatile ocean mixing layer model that allows some control over ocean-atmosphere interactions. The model is more computationally efficient than a fully coupled system while still allowing some ocean-air interactions. However, the ocean model does not allow horizontal mixing. The manuscript present some potential new results and I believe it is worth publishing in Geoscientific Model Development subject to the revisions as suggested below.

One of the main conclusions of the authors is that the coupling degrades the atmospheric mean-state through the introduction of SST biases. I agree that coupling al-

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ways introduce complexity and, therefore, can lead to the degradation of the uncoupled components. This is particularly true if the uncoupled model is highly “tuned”. In other words, good results from coupling in part depend on adjusting the individual component models. However, these simulations are not really coupled since the ocean model doesn’t allow horizontal mixing. So, I suggest the authors to replace the word coupling with something like “partial-coupling” in order to differentiate their results from studies based on fully coupled simulations.

The authors mention significant improvements or problems several times in the text, but they don’t mention the statistical significance of their results. The statistical significance could be easily incorporated at least in Figs 3 and 13. Figs 5 and 7 could also potentially benefit from a simple f-test. I would suggest that the authors include the statistical significance of their results whenever possible.

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