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Geoscientific Model Development Discussions

# *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

**Simon C. Peatman and Nicholas P. Klingaman**

s.peatman@reading.ac.uk

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It would be incorrect to refer to the coupling as "partial". In MetUM-GOML, the atmosphere-ocean coupler (OASIS) transfers the same information between atmosphere and ocean as it would in a model with ocean dynamics; the complexity of the ocean model has no bearing on the coupling. (It might be reasonable to refer to the blended grid boxes, indicated by 0 $<$ weight $<$ 1 in figure 1, as "partially coupled", because the atmosphere sees a weighted average of the ocean SST and a prescribed SST here, but certainly not for the weight = 1 regions.)

Although we do not make the change suggested by the reviewer, we emphasize that



the coupling is to a mixed layer ocean, without dynamics, wherever relevant (e.g., p4 l30; p7 l1; p7 l15; p8 ll1-2; p15 l2).

We thank the reviewer for the suggestion of adding indicators of statistical significance. Where the difference of two climatologies is plotted, a two-tailed Student's $t$-test on means is used ($H_0 : \mu_1 = \mu_2; H_1 : \mu_1 \neq \mu_2$) with $p = 0.01$. For precipitation, significance is indicated by stippling (figs 2b, 3a, 3b and 4) or (where wind vectors are also drawn so stippling would be in the way) insignificance by grey shading (figs 13a–c). For wind, vectors are shown only if at least one of $u$ and $v$ is significant (figs 2e, 3c, 3d and 13a–c). Where the ratio of two variances is plotted, a two-tailed $f$-test is used ($H_0 : \sigma_1^2 = \sigma_2^2; H_1 : \sigma_1^2 \neq \sigma_2^2$) with $p = 0.05$. Significance is indicated by stippling (figs 5b, 5d, 7b, 7c and 13d–f). These tests are also described in the main text (p5 ll20–24).

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