Geoscientific
Model Development
Discussions

Interactive comment on "Correcting a bias in a climate model with an augmented emulator" *by* Doug McNeall et al.

Anonymous Referee #2

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The authors seek to produce an emulator that can account for some of the known biases in a climate model when the aim is to find a 'good' parameter set to represent observations. Overall, I think the idea is a good one and the augmenting of the emulator in this case clearly works to make a better emulator for model constraint. The paper is well written and the method easy to follow. The work should be published in GMD.

I have a few points to discuss:

I am pretty confused about the 'beta' parameter and what it means in both the original model and the emulator here – can this be clarified in the text please.

How much do you need to know about the present bias? It's clear the authors had information on this and a good idea from the modellers where the biases came from

but it's less clear what they may have done with less information.

Page 11,Line 26: 'Moving any . . .' I find this sentence confusing. Can you better link it to the figure and clarify?

Figure 14: There is a clear relationship with V_CRIT_ALPHA and NLO when the augmented emulator is used. Can you discuss this and what it might mean?

Page 17, line 5: Is it temperature and precipitation that should be targeted or how the model treats them? It's not clear to me exactly what you are recommending.

Page 17, line 18: If you were to this for every grid box would you expect predictability?

I could see this method working for elevation and seasonal biases? How might you go about this?