Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., referee comment RC2
https://doi.org/10.5194/gmd-2021-415-RC2, 2022

Comment on gmd-2021-415

Anonymous Referee #2

Referee comment on "Efficient high-dimensional variational data assimilation with machine-learned reduced-order models" by Romit Maulik et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2021-415-RC2, 2022

Excellent paper. Great improvement from previous studies where the ML approach learns only the misfits whilst the authors have implemented an on-the-fly system.

Figure 3 and 4 need to be together for a better comparison.

Architectures of networks used?

Was layer normalisation used? Why not?
What other temporal NN could be used? Transformers?
What is the effort of using a CNN instead of a PCA reduction to feed the LSTM AE?
I would like to see a brief discussion of how an adversarial approach might help the rollout of the forecast here.