Interactive comment on "CNOP based on ACPW for Identifying Sensitive Regions of Typhoon Target Observations with WRF Model" *by* Bin Mu et al.

Anonymous Referee #3

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[12pt]article epsfig, amsmath

Review of "CNOP based on ACPW for identifying... WRF model
by Mu et al."

The paper describes an algorithm –ACPW– to compute conditional nonlinea

C1

mal perturbation –CNOP– using the WRF–ARW model to identify sensitive ar typhoon-target observations. The authors apply it to two cases –Filow and Matm sults are based on maximizing the total dry energy. They then compare their with those obtained using the adjoint model algorithm.

The authors conclude that the ACPW provides over all better results than the algorithm, particularly in the sensitive regions, and is more efficient.

Recommendation

Reject and resubmit.

Although the idea put forward in the paper is good the writing really needs atte
Besides, I find that the notation related to the equations is not proper.
I was caught between major revision and reject/resubmit. But it seems that the needs major rewriting and also need to be checked by a native speaker.

Major concern

Equations and notation
Starting with the line 10, pg3, – a perturbation of a quantity φ is conventionally $\delta\varphi$ (like φ'), where δ is understood to be an operator. The notation $\zeta\varphi_0$ is misle
In addition, $\delta\varphi_0$ of φ_0 not Φ_0.
Also requring $\|\varphi_0\|^2 \leq \zeta$? ζ is an operator in the text and now it is like a number

The costfunction J is introduced in top of pg 3, but only explained and detailed 2 later?

P: projection operator – what kind of projection, and on which space?

Φ_t (should be φ_t for consistency) is not an operator – it is the state of the syst time t

l18: CNOP is an optimization algorithm and not a cost-function
l23: environment idealized ??? Forecast income ???
Time consumption: CPU time.

Content
1. Above all, it is not clear what is the main difference with Zhang et al. (2108
what is the advantage of the new algorithm. Any concrete results ?

2. The authors use PCs to reduce the problem dimension. It is not clear how th
are obtained: PCs of what, and what is the sample size used to get these PCs
the authors using the 24-hr data with 6-hr sampling?

3. Not clear how is the sensitive region determined as CNOP only identifies
perturbations. Are the authors computing the costfunction for different regions
compare them?