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Nonlinear Processes in Geophysics
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Interactive comment on "Conditional nonlinear optimal perturbations based on the particle swarm optimization and their applications to the predictability problems" *by* Qin Zheng et al.

Qin Zheng et al.

qinzheng@mail.iap.ac.cn

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Authors' Responses We are very grateful to the anonymous reviewers for their constructive comments and suggestions that have helped us improve the manuscript (npg-2016-55). We have modified our manuscript according to your comments and suggestions in the revised manuscript. In the following, we reply all the comments and suggestions: Comments of Reviewer #2: C1. In the numerical experiments, the filtering method are taken as the benchmark. It is better to describe what the filtering method is and its concrete steps. A1. Thank you very much for your useful suggestions! We have added this content in the revised manuscript. Please see Page 9, lines 4-10. C2. There are several parameters to tune when the PSO approach is used.

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Discussion paper

The authors should better indicate if the results are sensitive to these parameters, like the initial velocity, and the inertial weight. A2. The initial velocity often sets at about 10-20% of the dynamic range of the variable on each dimension (Eberhart, 2001). In this study, we set initial velocity sets at about 100% of the range of the variables. Inertia weight =0.729 and accelerating factors c1=2.05, c2=2.05 are commonly used parameter values for the PSO (Clerc, M., and J. Kennedy., 2002; Banks et al., 2007, 2008). Considering both the computational time and the optimal precision, we take the population size of the PSO as 60, and the maximum evolutional generation as 200. The results are dependent on the choosing of inertia weight and accelerating factors. Fortunately, 0.729, 2.05 and 2.05 are effective for general optimization problems. In addition, it seems that there is no general set rules of population size and maximum evolutional generation that are suitable for any optimization problems. C3. The authors also mentioned the generic algorithm (GA). If possible, a simple comparison of this approach to the PSO would help the reader a lot to know the advantage of the PSO approach. A3. Thank you very much for your valuable suggestions! We have added content of the comparison in the introduction. Please see Page 3, lines 16-21. C4. P1 Ln10: the CNOP method has been . . . should be the CNOP has been. . . A4. We have deleted the "method". Please see Page 1, line 10. C5. P2 Ln13: Kalnay, 2003 should be Kalnay 2003. A5. We have revised the error. Please see Page 2, line 11. C6. P5 Ln 3: T also depends on u0 . A6. Thank you very much for your valuable suggestions! We have made the corresponding revise. Please see Page 5, line 2. C7. P7 Ln7-8: The Ikeda model is better to rewrite in (x1, x2) instead of (x, y) to make it compatible with note on P8 Ln7. A7. Thank you very much for your helpful suggestions! We have changed the form of Ikeda model in section 2.4. Please see Page 7, lines 7-8. C8. P10L3: are completely same . . . should be are completely the same . . . A8. We have made the corresponding revise. Please see Page 10, line 15.

Please also note the supplement to this comment:
http://www.nonlin-processes-geophys-discuss.net/npg-2016-55/npg-2016-55-AC2-

supplement.zip

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