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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Estimating the State of a Geophysical System with Sparse Observations: Time Delay Methods to Achieve Accurate Initial States for Prediction" *by* Z. An et al.

Z. An et al.

z1an@ucsd.edu

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See the supplement

Please also note the supplement to this comment:
http://www.nonlin-processes-geophys-discuss.net/npg-2016-22/npg-2016-22-AC2-supplement.pdf

Interactive comment on Nonlin. Processes Geophys. Discuss., doi:10.5194/npg-2016-22, 2016.

Authors' Response to Referee

May 27, 2016

Overall

Thanks for the suggestions from the referee. The paper will be better organized after we incorporate the modification based on the comment of the referee. The essential details will be added in the final version.

Responses to Specific Comment

5. Page 2, line 16. L_s is not properly defined. The authors should explain a bit more precisely what it is meant by "critical threshold" ?

Response: In Whartenby et al's paper and this paper, different dimensions of the observation have been tested to achieve the accurate prediction. When the dimension is larger than the threshold L_s, the prediction quality is reasonably acceptable, and the root mean square error (RMSE) can be reduced to a relative low order. However, for any dimensions smaller than L_s, the RMSE increases abruptly, which indicates the approach to the accurate prediction fails.

(Whartenby, W., J. Quinn, and H. D. I. Abarbanel, "The Number of Required Observations in Data Assimilation for a Shallow Water Flow," 20 Monthly Weather Review 141, 2502-2518, (2013).

6. Page 3, line 5. Notation or text must be improved. Is $\mathbf{y}$ a L-dimension vector?

Response: $\mathbf{y}$ is an L dimensional vector, which is constructed by the mea-

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Fig. 1.