Hydrol. Earth Syst. Sci. Discuss., 8, C6104–C6105, 2012
www.hydrol-earth-syst-sci-discuss.net/8/C6104/2012/
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Hydrology and Earth System Sciences Discussions

Interactive comment on "Groundwater flow inverse modeling in non-MultiGaussian media: performance assessment of the normal-score Ensemble Kalman Filter" *by* L. Li et al.

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Received and published: 15 February 2012

We thank reviewer #1 for his/her comments. Our reply to his/her questions follows:

The reference to the computational advantage of the ensemble Kalman filter with regard to more traditional optimization-based approaches is made in a generic way in the introduction. It is something that has been shown in the literature and references are included in the manuscript therein.

We understand that the concern of the reviewer regards the additional forward and backward normal-score transformations required by the NS-EnKF used in the paper.

While it is true that these steps imply some extra computing, the additional work is marginal regarding the rest of the filter steps, therefore, the advantage of the NS-EnKF, computation-wise, is retained.

The effect of the number of conditioning piezometers is relevant enough to deserve a specific treatment on itself. We agree with the reviewer on the interest of this analysis, but, in this paper, we analyze many other issues (a total of 14 scenarios) and we consider that this preliminary analysis of the impact of the number of piezometers is enough for the scope of the paper. It is clear that there is a number of conditioning piezometers below which the characterization is not possible, and we are working on trying to relate this number and its spatial distribution to the characteristics of the problem. But we feel that this paper is not the place for this detailed discussion.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 6749, 2011.