

Interactive comment on “Accelerating assimilation development for new observing systems using EFSO” by Guo-Yuan Lien et al.

Anonymous Referee #2

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The manuscript proposes an efficient method for choosing appropriate data selection criteria for new observing systems based on EFSOI. The usefulness of this approach is demonstrated with the assimilation of precipitation observations. The findings of the paper are interesting, it's very easy to read and well-written. It should be suitable for publications after addressing the following few remarks.

There is one issue that the authors should investigate a bit more. Usually, the number of beneficial observations should be slightly above 50%. When the number is much higher, I strongly suspect that the observations are correcting or compensating some model bias. Otherwise it's unlikely to achieve numbers up to 70%. Very low numbers likely indicate the opposite effect, i.e. that there is a model bias which prevents the effective use (which is also indicated by the plot of FSOI versus precipitating members).

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I think it would be very interesting to investigate this more and show more bias statistics (e.g. regional plots).

Minor remarks: 1) The WMO DAOS group recently decided that the term FSOI should be used (where "I" stands for impact) instead of FSO. I recommend following this and using EFSOI. I think there is a document on the WMO website with more details. 2) I don't think QC is the appropriate term for data selection and it's potentially misleading. Why not calling it "data selection criteria" or "observation preprocessing"? 3) Introduction: It would be good to make the discussion and literature review of strengths and weaknesses of EFSOI a bit broader and more critical. The method obviously has strengths, but also some weaknesses. E.g. there is a linearization involved, there are spurious correlations, potential bias (correction) issues and observations interact (adding a new type may decrease the impact of others).

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