

Interactive comment on “Enhancing temporal correlations in EOF expansions for the reconstruction of missing data using DINEOF” by A. Alvera-Azcárate et al.

R. O'Donnell

ryan.odonnell@stryker.com

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We have developed a very similar algorithm to DINEOF for a different purpose, and one limitation we discovered in low signal-to-noise situations (like many climate field situations) is the least-squares penalty for missing the high frequency noise exceeds the penalty for missing the low frequency signal. The algorithm, then, preferentially matches noise over signal. This approach would seem to help resolve the issue.

I do have two questions. Based on the temporal smoothing, I would expect to see more significant autocorrelation in the results than without smoothing, which would suggest that this should not be used without some caution. Assuming AR(n) noise, the value

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for n would therefore be dependent not only on the number of EOFs retained but also on the filter used. I am curious if you saw this in your Black Sea test.

The second question is related to filter selection. There are many different routes one could use to arrive at a particular filter choice. This is now an important decision. While I can see a potential route of performing cross-validation tests using different filters (or a range of settings for a particular filter), it is quite possible that the resulting reconstructions would result in materially different conclusions despite nearly indistinguishable cross-validation statistics. It would seem important, then, that the unfiltered reconstruction be presented alongside the filtered reconstruction to allow the reader to assess the effect of the filter whenever this procedure is used in published research.

On the whole, however, the technique looks interesting and promising.

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