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Discussions

Interactive comment on "On the resolutions of ocean altimetry maps" *by* Maxime Ballarotta et al.

Anonymous Referee #2

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This paper: "On the resolutions of ocean altimetry maps" uses spectral coherence between SSH maps and along-track and tide gauge SSH measurements. The calculations seem correct and the figures are interesting, but to me, this approach is complicated because it combines together the resolution of the maps and the length scales of the processes being imaged. For example, in the equatorial region they estimate spatial resolution at 800km, far bigger than the altimeter track spacing. Chelton, a co-author on this paper, has done a lot of work on evaluating sampling from satellite observations of both SSH and wind (Schlax, et al., 2001), and has examined the transfer function of linear mappings (Schlax and Chelton 1992). The latter paper focuses on the effects of the mapping as a smoother of the original field, examining the resolution of the mapping independently from the length scales of the mapped fields. A similar approach could be used here, taking out the correlation of the underlying fields to focus on the smoothing done by the mapping. This is what I expected from the analysis, and

I feel that the differences should be discussed and the results presented here put in context as a combination of two effects.

I would also like to request that the authors please also address why they do not compute decorrelations in physical space and time instead of coherence. This would allow the preservation of spatial structure that is removed by the stationarity assumption built into the coherence calculation, including the averaging over large regions to get adequate coherence statistics. Since only a decorrelation distance is reported, the sacrifices needed to be able to make the coherence calculation do not seem necessary, and a region-by-region decorrelation scale could have been reported. This would still have mostly represented the scale of the SSH field, not the mapping, but it would be simpler to compute, report, and understand.

references:

Sampling errors in wind fields constructed from single and tandem scatterometer datasets. J. Atmos. Oceanic Tech., 18, 1014-1036, 2001. (Schlax, M. G., D. B. Chelton, and M. H. Freilich.)

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