Ocean Science
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comment**

Interactive comment on "A multiscale ocean data assimilation approach combining spatial and spectral localisation" *by* Ann-Sophie Tissier et al.

Anonymous Referee #1

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This paper presents a multiscale data assimilation method to take into account both large and small scales oceanic processes in an ocean operational system by spectral and spatial localisations. The paper is globally well written: most of the technical part is clear and the results are convincing.

My main questions are about the spectral transformation: 1) why the spherical harmonics transformation has been chosen? What is the strengths of this transformation compared to other spectral transformations?

2) It seems that after the spectral transformation, each term (corresponding to a given wavelength of a spherical harmonic) has particularlly a statistical sense, I just wonder if it also always has a physical interpretation, i.e. corresponds to an oceanic process at a specific scale. Even if so, do they really correspond to the scales observed in the

data?

3) It is not clear to me how the observation error standard deviation along each spherical harmonics is obtained in the twin experiment. More importantly, how it can be obtained in realistic case?

Minor questions or remarks:

1) In Fig. 7, why small difference exists between the black and the green curves before the critical scale while almost no difference between the blue and the black curves after the critical scale?

2) many small spelling mistakes, please check

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