

## ***Interactive comment on “Surface drifters in the German Bight: Model validation considering windage and Stokes drift” by Ulrich Callies et al.***

**Anonymous Referee #1**

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The trajectories of 6 surface drifters are compared to simulations of circulation by two numerical models in the German Bight. For one model, the numerical simulations of drifter tracks include direct downwind slip or Stokes drift estimated from a wave model. This inclusion appears necessary to compensate insufficient vertical resolution of the model. Substantial model errors, that dominate at low winds, are explained in terms of inaccurate Eulerian currents and lacking representation of the sub-grid scales processes by the models. The limit of trajectory predictability is also addressed. This paper is clear and well written, although some parts can be substantially shortened to increase readability (see below). The scientific topic is interesting and the comparison between drifter observations and simulations is done rigorously. The results show that when using a model with reduced vertical resolution, direct windage or Stokes drift

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must be added in order to better predict surface drift. However, the explicit inclusion of Stokes drift does not produce an added value compared to a simple parameterization of wind-induced slip.

I recommend publication of this manuscript in Ocean Sciences after minor revision and after the authors have addressed the following specific comments.

Page 4. Paragraph 2.1. Please add the sampling frequency of the drifters. Was there a drogue presence sensor? Are you sure that the drogued-drifters kept their drogue during their entire drift? What is “ $R = \text{drag area in water} / \text{drag area in air}$ ” for the drogued drifters?

Page 8. Paragraph 3.1 Line 9. Change “a view day” to “a few days”

Pages 12 to 19. Paragraph 3.2. The descriptions of the observed and simulated drifts for the different periods is too long and the reader might be bored reading all these details. I suggest to shorten these 4 pages of text by at least 50% to increase readability.

Page 20. Figure 9. Histograms represent the frequency of occurrence in selected classes of parameters. I would use the word “bar” instead of “histogram” to show distances versus time in Figure 9a and d.

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