

Interactive comment on “Air-sea momentum flux climatologies: A review of drag relation for parameterization choice on wind stress in the North Atlantic and the European Arctic” by Iwona Wrobel-Niedzwiecka et al.

Anonymous Referee #2

Received and published: 7 August 2018

The authors selectively review parameterizations of drag coefficient over the open ocean and evaluate the differences in stress that result. The methodology used is to take a satellite-derived data set of wind speed and use these as observations for bulk formulae evaluations of the momentum flux. Seven algorithms are compared. Differences in the momentum flux are (globally) about 14% and are comparable for different geographic regions, with some differences. This is a rather limited study. It uses scatterometer-derived neutral winds, which means the bulk flux algorithms can be directly compared without stability differences being a factor. This is fine, but it does

Printer-friendly version

Discussion paper



mean that the study does not yield much that is not already known or can be inferred from the equations themselves. Essentially the differences in momentum flux come straight out of the differences in the equations (illustrated in Fig. 1). The results are statistically-based, i.e. averages and mean differences, so there is not any link to atmosphere or ocean physics or dynamics. The choice of bulk flux algorithms to focus on is rather limited. There are a few well-known 'early' equations and then a couple of well-known later ones, but there are many very popular algorithms which are not evaluated, e.g. Smith (1988), the COARE algorithm (probably the most popular now), and others covered by other inter-comparisons. The study covers similar ground to that of Brunke et al. in a series of papers in the 2000s – see below for references. There is nothing wrong with this study, so I don't have any objections to it being published. However I am afraid I don't think it adds enough new to merit publication, so I cannot recommend it is published.

Minor comments There abstract is too long and there are numerous English errors.

References

Brunke, M. A., Fairall, C. W., Zeng, X., Eymard, L., & Curry, J. A. (2003). Which bulk aerodynamic algorithms are least problematic in computing ocean surface turbulent fluxes?. *Journal of Climate*, 16(4), 619-635.

Brunke, M. A., Zeng, X., & Anderson, S. (2002). Uncertainties in sea surface turbulent flux algorithms and data sets. *Journal of Geophysical Research: Oceans*, 107(C10), 5-1.

Brunke, M. A., Wang, Z., Zeng, X., Bosilovich, M., & Shie, C. L. (2011). An assessment of the uncertainties in ocean surface turbulent fluxes in 11 reanalysis, satellite-derived, and combined global datasets. *Journal of Climate*, 24(21), 5469-5493.

Smith, S. D. (1988). Coefficients for sea surface wind stress, heat flux, and wind profiles as a function of wind speed and temperature. *Journal of Geophysical Research*:

[Printer-friendly version](#)[Discussion paper](#)

Oceans, 93(C12), 15467-15472.

Interactive comment on Ocean Sci. Discuss., <https://doi.org/10.5194/os-2018-61>, 2018.

OSD

Interactive
comment

Printer-friendly version

Discussion paper

