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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Observations of surface momentum exchange over the marginal-ice-zone and recommendations for its parameterization" *by* A. D. Elvidge et al.

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The manuscript is based on a large amount of data and the analyses are well planned, detailed, and carefully made. The manuscript is well written. I suggest acceptance subject to minor revisions specified below.

1. The first sentence of the Introduction is an oversimplification. In addition to the three forces mentioned, sea ice motion is affected by the sea surface tilt and Coriolis force (e.g. Vihma and Launiainen (1993), JGR, equation (1), but be aware of the missing + sign between ice-water stress and internal stress). The Coriolis force affects the deviation angle between the wind and ice drift vectors (also affected by the internal ice

resistance and ice-water drag). The thicker is the ice, the larger is the deviation angle due to Coriolis force.

2. The importance of the results could be better illustrated via idealized calculations. For example, to illustrate the importance of the differences between the drag coefficients obtained from different parameterizations, you could calculate their effect on 10-m wind speed, assuming neutral stratification and a certain wind speed above the boundary layer. Further, the sensitivity of the ice drift speed on the value of the drag coefficient could be calculated assuming a certain 10-m wind speed, steady-state conditions, no ocean current, and a certain value for the ice-water drag coefficient. Some more assumptions / idealizations may be needed. Such calculations would help a non-specialist to understand how much a small difference in the drag coefficient matters for the dynamics of the atmosphere and sea ice.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 26609, 2015.