Atmospheric
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Discussions

Interactive comment on "On direct passive microwave remote sensing of sea spray aerosol production" *by* I. B. Savelyev et al.

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Itemized author response to Anonymous Referee #3 is given below.

Reviewer: "The authors of this paper present a new sea spray source function, based on brightness temperature, which incorporates several aspects of the sea surface conditions (roughness and foam). This function, derived from fitting curves through measurements, is compared to the most well-known sea spray source functions that were based on wind speed only. The approach is original and findings are discussed thoroughly in terms of physical meaning and in terms of the consequences of different approaches. The paper is well written and deserves publication. Still, I have a few questions and remarks.

P15388: I'm a bit confused on which data are used: FLIP or COAMPS meteorology. It is mentioned that in Fig 7 the presence of foam only starts from wind speeds above 7 m/s, but in Fig 1 the FLIP data only show wind speeds >7 m/s for the episodes with TB measurements. The same holds for the curves for the different wind speeds. COAMPS however has wind speeds around 5 m/s on day 118. Do you use the data for the emissivity model as well? In the meteorology section it is only explicitly mentioned that COAMPS was used for running HYSPLIT. Can you clarify this?"

Response: The values of wind speed used in Figure 7 were obtained directly from the Vaisala meteorological station located at 10 meters above mean water level. This point is now clarified is Section 5. Slightly higher wind values seen in Fig.1a (black curve) were registered by the Davis station located at 24 meters. COAMPS data was not used in any way to produce figures 5-10.

Reviewer: "P15395: You suggest to replace U10 by TB in existing relationships. It would be interesting to show an example of the result. In addition, if you replace _T in eqns 13 or 14 by the proposed fit (eqn 15) you could comment on the general dependency of your sea spray source function on the wind speed (exponent of U10) and compare that to literature values based on wind speed only (U10^3, U10^3.41)."

Response: Both steps have been added to section 6.3, as suggested.

Reviewer: "P15396: Sea state and resulting TB may vary considerably within a day. What kind of resolution in terms of space and time do these satellites provide? Would that be enough for an assessment of sea spray production for e.g. climate models, for which sea spray concentrations are highly relevant? These models would typically require meteorological/oceanographical fields as input every 3-6 hours."

Response: Spatial and temporal resolutions vary from satellite to satellite, as well as among numerical models. Our rough estimate suggests that at the present time it is possible to obtain the desired product ∼ 4 times per day at ∼30km spatial resolution, which is similar to spatiotemporal grid spacing of a global aerosol model NAAPS. This

estimate has been added to section 6.4.

Reviewer: "Technical comment P15373: TBP is already used but only defined op P15374 (eq.7)."

Response: Corrected.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 15363, 2014.