

Interactive comment on “Direct aerosol chemical composition measurements to evaluate the physicochemical differences between controlled sea spray aerosol generation schemes” by D. B. Collins et al.

Anonymous Referee #2

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This study compares three different methods of generating sea spray aerosol (SSA) in the SIO wave channel. The three methods result in different number size distributions and different relative abundances of chemical particle “types” due to different bubble size distributions. The presence of foam on the surface also affects the SSA number size distribution when the organic content of the seawater is high (much higher than found in the ocean). This is innovative research and should be published in AMT. I offer a few suggested changes below.

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1. A caveat should be stated upfront that while these laboratory studies are meant to mimic a breaking wave on the ocean and the subsequent production of SSA, there may be other factors over the real ocean that are not being represented in the laboratory studies that control the flux and composition of SSA.
2. Page 6460 line 10. Isn't this true at any wind speed?
3. The ATOFMS measures particles down to 0.3 μm Dva. Why do the chemical data in figure 2(a) go down to 0.1 μm ? Why don't the three plots cover the same size range? Most of the particle number is in sizes less than 1 μm . Why are most of the ATOFMS counts in particles around 2 μm .
4. It should be pointed out that the ATOFMS is looking at the tail of the number size distribution. That is clear from figure 6 but hidden in the log plot in figure 2. There is no information here about the chemical composition of most of the generated number population.
5. I assume the y axis in figure 2a is number fraction and not mass fraction. That should be made more clear.
6. I realize there are uncertainties in converting between D_p , D_v , and D_{va} , but in comparing figure 2a and 2b it would be nice to use the same particle diameter on the x axis.
7. Is figure 4 the total size range of the ATOFMS?

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