Review comments for Sofieva et al.

In this paper, a bubble bursting device was designed, and the effect on spray aerosol production (such as the lifetime of bubbles, bubble size, foam area, salinity, and temperature) were analyzed. Through the step-by-step adjustment of the conditions of these factors, some bubble bursting conditions are covered. And the experimental results of saltwater are compared with the seawater, which is consistent with some previous studies. This study has some serious problems that need to be addressed.

Major comments:

(1) I do not think aerosols produced from a very narrow size range of bubbles (~5-10mm) can be called sea spray aerosols. They are certainly bubble bursting aerosols, which can be related to sea spray aerosols. But sea spray aerosols are produced from a wide range of bubbles. A recent study (Jiang et al. PNAS 2022 119:e2112924119) shows submillimeter bubbles would be more important in submicron sea spray aerosol generation. I would just call the spray aerosol produced from your setup "bubble bursting aerosols". Please remove sea spray aerosol from the title and discuss how your finding can be linked to sea spray aerosol.

(2) The figures of this article do not meet the publication quality, and I hope these can be improved. (see the details in specific comments)

(2) The fluid properties of water, such as density, dynamic viscosity, and surface tension, can be changed by water temperature. Salter et al. (2014 JGRA doi: 10.1002/2013JD021376) observed that the size range of bubbles on the water surface changed significantly with temperature; for example, bubbles with a radius of less than 2 mm observed a significant decrease in number with the temperature increased. Can you have some more discussions about this impact?

I would add a figure to show the effect of temperature on the size of the bubble formation.

(3) When the temperature is above ~10 °C, the dependencies of the aerosol production on the temperature are not obvious. It seems to be inconsistent with many previous publications. Can you have some more discussions about this impact?

(4) Is the temperature of the input air stream in the chamber well controlled? Is it always at room temperature, or is it the same as the water temperature?

Specific comments:

Line 55: For the analysis of predominant (~60-80%) submicron particulates, Jiang et al. PNAS 2022 have proposed a newfound flapping mechanism that caused the film drop production in detail and can be discussed here.

Line 180: I would use the DMA selected NaCl particles to check if the OPS data can be used without any diameter conversion.

Figure 2: Please label the sub and superscript properly. Also, can you be more serious about the description of the horizontal and vertical axes?

Figure 4: Since the article has described the particle size conversion of each instrument, D_p should be added to the abscissa here.

Figure 5: Why doesn't the vertical axis even have a title? Even the normalized proportions should be noted. Can the legend be put aside or some places more appropriate? I don't think the current position is proper.

Line 404: It should be "10 ℃".

Figure 6、7、8: If the color matching can be changed like this: as the temperature increases, the color of each line changes from light to dark or gradually increases to deeper color, which may be better for the trend display. Just like the salinity in Fig.5.

Line 460: In Jiang et al., bubbles smaller than about ~1 mm can predominantly contribute to submicron droplets, which can be discussed here.

Figure 9: It is recommended to write clearly about the horizontal and vertical axes. The data calculated by which equation need to correspond to the red dot and yellow line in this figure. What does it mean to write eq.4 in the red dot legend and write eq.3 in the caption?

Line 614: It should be “0.6 M of NaCl”.