

Interactive comment on “A miniature Marine Aerosol Reference Tank (miniMART) as a compact breaking wave analogue” by M. Dale Stokes et al.

Anonymous Referee #1

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This submission reports on a new system, the miniature Marine Aerosol Reference Tank (miniMART) which has been designed after the success of the original MART system, to approximate a small oceanic spilling breaker by producing an evolving bubble plume and surface foam patch.

This smaller tank utilizes an intermittently plunging jet of water produced by a rotating water wheel to simulate bubble plume and foam formation and generate aerosols. This system seem to reproduce bubble plumes characteristic of small whitecaps without the large external pump and should ease the culture delicate planktonic and microbial communities in the bulk water during experiments while continuously producing aerosols for study.

This paper is well written and I have only very minor comments to be dealt with prior to

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publication.

There is a clear emphasizes on reproducing a correct bubble size distribution in the tank. At several locations, the authors underlie the critical aspects of having the correct timing of the intermittency. Is this most important parameters (even beside other characteristics of the plunging sheet)?

The tank is made of stainless steel, plexiglass and silicone wherever possible to minimize chemical contaminants and facilitate cleaning. However, plexiglass is typically avoided in system dealing with aerosols, and silicone is a known anti-foaming agent (that may alter the foam produced in the tank if badly applied). Maybe the authors could comment on these two points?

MiniMART has been built to facilitate the culture delicate planktonic and microbial communities in the bulk water during experiments. I'm therefore wondering why it is not thermostated to have a better control the culture. Indeed, they be damaged by both temperature and mechanical actions of the water (due to the pumping).

Finally, this paper aims at providing standard techniques. In this context, figure 2 is not informative enough for the reader willing to reproduce that tank (also more information about the needed water levels can be added). It is stated that “a plunging water jet best replicates the bubble plumes generated by an oceanic whitecap”, while this paper discuss a plunging sheep (small vs. large tank). Now as a reader willing to use such techniques, I would appreciate have precise information on the technique to use for a given scientific or technical objective. Maybe the authors could consider adding some clear (maybe even tabulated) recommendations on the tank to use, with pros and cons.

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