

Hu et al. describe the wealth of measurements they applied to a multi-part phytoplankton bloom experiment. Specifically, they characterized the POC-DOC cycle across the bloom and through the enrichment and transfer processes among seawater, sea surface microlayer, and sea spray aerosols (separated into submicron and supermicron populations).

I commend the authors in this version of the manuscript. I believe the content and figures are clearer and more specific, and the paper is much stronger than the previous version. The authors have fully addressed the concerns raised during the last round of revisions, and I believe this paper is much stronger. I do recommend for publication after addressing a few more minor edits, see below.

1. The paper would benefit from a final pass through correcting grammatical errors, namely issues with article placement in sentences and use of consistent tenses. Some examples are below:
 - a. Line 241: “As **a** common...”
 - b. Line 242: “...accumulates in **the** SML...”
 - c. Line 243: “...significantly **reduces** surface...”
 - d. Line 252: “...the development **of** capillary waves...”
 - e. Line 254: “...observed in **the** SML...”
 - f. Line 283: “...are pushed upward, **form** a...”
 - g. Line 287: “Compared to **the** particle size distribution...”
 - h. Line 456: “...are “pulse events” in **the** ocean-atmosphere organic...”
 - i. Line 478: “...Chl-a is a **driving** factor regulating...”
 - j. Supplement line 17: “...Copernicus Data Store was **checked to determine** whether...”
2. On line 356, it's stated “Consequently, HULIS1 have greater abundance in the SML and SSA compared to HULIS2 (Fig. 5c).” However, looking at Fig. 5c, it appears that HULIS2 has a greater relative abundance than HULIS1 in the SML. But I agree that $HULIS1 > HULIS2$ is a valid statement for SSA.
3. On line 366, it's stated “...however, when sample types differ, significant correlations between them are rarely observed (Fig. 5d).” While I agree with what you're trying to say, of the 14 squares with high correlation (where I'm assuming the white text in the colored box indicates high significance), 4 are between different sample types. I would suggest rephrasing the sentence to better clarify that while most of the high

significance correlations occur between samples of the same type, there are 4 cases between samples of different types that exhibit significant correlations.

4. On lines 407-409, the increased percentage of saccharides in SSA is connected to the peak biological activity in the SML. While I think there is a connection, the biological activity and saccharide abundance in the SML doesn't appear to change significantly from day 10 to 14, so I have a hard time believing that's the cause for the shift in SSA saccharide abundance increase on Day 14. I agree they are linked, but I think the statement currently is an over-generalization.
5. On lines 435-436 there's a typo with an incomplete reference to a Figure and an accidental paragraph break.
6. The caption for Figure 6 is incomplete. It's missing a description of panel a, where the current description of a applies to b, and b to c.
7. A general comment for section 3.3.3: I agree with all of the information as it is presented. However, I think it's a bit of an over-generalization to only talk about film drop production impacting submicron SSA and jet drop production impacting supermicron SSA when jet drops produce up to 43% of submicron SSA (see Wang & Deane et al., 2017, PNAS). It's common to generalize with the distinction of film/jet for submicron/supramicron, but I think this paper would be strengthened with a statement acknowledging this generalization and the influence of jet drop production in determining submicron SSA composition.
 - a. Wang, Xiaofei, Grant B. Deane, Kathryn A. Moore, et al. "The Role of Jet and Film Drops in Controlling the Mixing State of Submicron Sea Spray Aerosol Particles." *Proceedings of the National Academy of Sciences of the United States of America* 114, no. 27 (2017): 6978–83.
<https://doi.org/10.1073/pnas.1702420114>.