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Interactive comment on "Seasonal Sinking rates of Transparent Exopolymer Particles (TEP) concentrations with associated Carbon flux in adjacent Bohai Seaand Yellow Sea" *by* M. Shahanul Islam et al.

Anonymous Referee #2

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This manuscript presents seasonal distributions and sedimentation rates of TEP in the north Chinese sea, and discusses the impact of TEP on carbon cycle in the region.

This manuscript is very poorly written and has to be extensive rewritten. I strongly recommend to have a native English speaker to edit this manuscript prior to any eventual resubmission. At present, it is extremely difficult to read. I do not provide any suggestion for improvement on the style, because at this level, I feel that it is out of the scope and duty of a reviewer to do such an extensive editing. Apart from the low level of English, in my opinion, this manuscript suffers from critical drawbacks regarding the

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methods and data interpretation. Below is a list of the main issues.

- The data are presented as average without giving standard deviation. This should be done. All the discussions are based on a comparison of the average values, but based on Figures 4 and 5, there are not differences (no statistical differences), neither between depths, region, nor seasons. Therefore, a paragraph such as “3.4 Seasonal and regional TEP sedimentation”, largely overinterpret the data.

- The sampling depths are not given. This should be done, and showed on the surface plots D, 3E and 3F.

- Because TEP concentration is known to vary vertically as a function of the vertical stratification, and to accumulate at the pycnocline, I my opinion it is important to show the vertical stratification at each station during sampling. Although the sampling strategy is not well described (the authors only wrote that “each station was designated with three distinguishing depths for better graphical analysis”), I understand that sampling was performed independently from the position of the pycnocline.

- It is not necessary to show the TEP-C, unless it is to be compared to POC data. Calculating the TEP-C concentration is only useful if one seeks to address the carbon budget.

- Regarding the hydrology of the studied area, the authors wrote that “The Bohai Sea and Yellow Sea had a complex dynamic environment with various seasonal and local geophysical currents”. It is not clear if Fig. 2 has been done with data collected during their cruises, or if these data are from a published study. If it is the later, a reference should be given. If it is based on another published work, if it is as dynamic as stated by the authors, how confident can we be that the same scenario occurred during sampling?

- Are the data of the phytoplankton community composition really useful for this study?

- Regarding the search for correspondence between the concentration of TEP and

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the other parameters (“3.6 Correspondence relationships of TEP”), the CCA analyses presented in Figure 6 do not show any relationship. Absolutely no pattern emerges from this analysis.

- Last but not least, the approach used to estimate the sedimentation rate of TEP is questionable, as it is does not allow to measure the real TEP sedimentation rate, because this approach assumes that losses from an upper layer is only due to sedimentation. This approach does not take into account other loss processes, such as inner wall attachment, or TEP accumulation at the surface. Such an approach is only valid for determining the sedimentation rate of conventional particles, which only settle down and do not stick to surfaces. As stated by the authors in their introduction, TEP raise at the surface and accumulate in the SML. Therefore, the TEP concentration in each compartment (upper, middle, and bottom) is not only the result of losses from the upper layer towards the bottom layer due to sedimentation, but also the result of the ascent of TEP from the bottom layer towards the surface layer. In addition, all the TEP that may have accumulated in the SML, will not be taken into account in the budget, and may incorrectly be attributed to sinking. In order to validate this approach for studying the sedimentation rate of TEP, one has to be able to close the budget, i.e. to make sure that the sum of the masses of TEP in the 3 compartments equals the initial mass of TEP. If the mass of TEP is not conservative, it is not possible to estimate the actual sedimentation rate.

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