

Dear Mingjin,

We thank you for the critical comments and suggestions to improve the manuscript (MS). We have considered the comments and modified the MS accordingly. Our detailed responses to the comments are given below.

General comments:

For your general comments, major corrections in the revised MS are made. Moreover, answers given to specific comments can be seen in the specific comments section.

Specific comments:

Comment:

I feel there are too many figures used in the manuscript. For example, Fig. 4-7 present CFD results, and do they have to be included in the manuscript? Can some of them be moved into the supplement? There are only three points in Fig. 8, and so is it necessary to have this figure?

Authors' response: Some of the figures present in the CFD result (Fig. 4-7) are now moved to electronic supplement (see the revised electronic supplement). In Fig. 8, we wanted to show how the mean flow velocity in the MWAC tube varies as a function of the outside velocity for the three cases. We have also moved Fig. 8 to the electronic supplement.

Comment: Line 457-460. Figure 13 is mentioned before Figure 10, and it took me a while to find Figure 13. In addition, can Fig. 13 be moved to supplement?

Authors' response: The figure is now moved to the supplement.

Comment: Line 553-554, line 651, line 641-642, and etc.: Quite frequently there are paragraphs which contain 1-2 short sentences. This makes the manuscript very fragmented and hard to follow.

Authors' response: Correction is made in the revised MS.

Comment: Line 38: The paper by Jickells et al. (2005) in fact discusses the effect of mineral dust on oceanic biogeochemistry and thus should not be cited here. Instead, it should be cited in line 40-

41. In addition, please consider citing new references instead of papers which were published >20 years ago.

Authors' response: Correction is made in the revised MS. Quite a few references we used are old indeed; but we cannot leave them as of our formulations are based on them.

Referee's comment: Line 13: change "As result" to "As a result"; Line 42: change "is ranging" to "ranging"; Line 56: change "on addition" to "in addition"; line 84: change "station shields" to "station, shields". There are many grammatical errors and awkward sentences in the manuscript, and careful editing of the manuscript is needed.

Authors' response: Correction is made in the revised MS.