Reply to reviewer 1:
We thank for the constructive review of the manuscript and the comments which we reply to below.

Abstract: Lines 29 -31 need rewriting
rewritten

Introduction:
Lines 63-68: include here amino acid –C and N yields because they are important diagenetic indicators.
added

Lin3 73: delete '; '
done

Line 72: replace indexes with indices
done

Sampling:
Line: 123: Add year of sampling
Done

Line 129: Replace 'concentration' with 'content'
After checking a dictionary we decided to retain concentrations as SPM in mg/L is in fact a concentration of mass per volume.

Analysis:
Line 157: Add the name of the reagent was used to prepare amino acids derivatives.
done

Results
SPM and POC: Add SPM and POC data for in situ pump samples.
These were not measured as filters were not pre-weighed. This is now clarified in the methods section where a paragraph has been added which explains which data sets have been used in which combination (also answering comments of reviewer #2).

SPM and POC data for the trap samples may be provided
Nitrogen isotopes data for trap samples not given
Amino acids:
No results for traps; in situ pumps presented.
We added two supplements which present the trap data as well as all amino acid data used in this paper:
The first supplement includes the trap data used in this study in a table with basically the same variables as Table 1. As concentrations are not feasible for trap samples we present particle fluxes in mg m-2 d-1.
The second supplement is a table of all amino acid data (in MOL %) used for the PCA which results are presented in Table 2 and Figure 5.
In-situ pump data are, unfortunately, restricted to d15N for technical reasons (see above). We included their d15N in order not to selectively omit data from our study.

Amino acids:

Line 186 and 187: Do you find relationship of amino acids with SPM and TPN
A relationship of amino acids and N was found and added to this section. There is no relationship with SPM so that this was not mentioned.

Methods used to calculate DI and RI need to be included in M & M section
done

Discussion
Line 197-200: SPM concentration and composition
done

It would be interesting to discuss the relationship of temperature and amino acids
Is it possible to have similar relationship between SST and TPN or SST and Amino acids?
We agree that this is an interesting and important topic but beyond the scope of this paper. One reason why we find it difficult to incorporate this topic here is that despite exposed to basically the same temperature gradient we find the difference of amino acid spectra between SPM and trap samples. So if we included temperature we would not have come to any reasonable results at this stage. We feel that this relationship needs further detailed experiments.

Line 217: Gly and Ser generally not taken up by particles
We may have missed this in the literature. To our knowledge several studies showed that also neutral amino acids including Gly and Ser can be adsorbed to mineral particles (Boski et al., 1998; Hedges and Hare,1987 ; Carter, 1978).

Figures and Tables
Figure 2: It would be useful to show vertical profiles for amino acids.
We would like to show these but we fear that this would add too many figures without adding information in addition to those of the PCA. To visualize some of the differences in amino acid monomers we decided to show at least the average spectra of new Figure 4 (old Figure 5).

Fig. 4. May be deleted and data can be given in the text.
Old Fig. 4 has been deleted