Dear Dr Laurent Pfister,

After second round of review of our revised manuscript, the reviewer stated that scientific significance, quality and presentation of revised manuscript are at the good level and recommended publication pending several minor corrections.

The comments of reviewer were addressed as following:

- *Lines 212-218 should be put in the methods to indicate the potential blank contributions. You should also provide the metal content of the acetate cellulose filters that are digested with the sample to estimate the elemental particulate concentrations in snow.* We agree and shifted this part to the Methods (now L 158-165). Note that these are MilliQ blanks of soluble fraction of snow. The second remark is on the blanks of filter digestion. We addressed this issue in submitted ms (L 127-129) and revised the text as following: "For the analysis of snow particles on filters, the blanks were estimated after digestion of 6 random filters. In the digestion solution, the concentrations of all trace elements were a factor of 10 to 100 lower than that obtained from the filters with particles after 0.5-1.0 L of snow water filtration", L 127-130. We do not think that adding a table with blank analysis will be necessary and we do not have sufficient statistics to recommend the values of metal concentration in commercial (Millipore) acetate cellulose filters. However, we added, as supplement to this reply, a compilation of average major and TE concentration in digestion products of blank filters and filters with snow particles (**Table R1**).

- *Lines 303-317: The use of "low mobile" and at the same time "volatile" to characterize the behavior of Pb is confusing. If Pb is considered as volatile should it not be highly mobile in comparison to other refractory elements? As the term volatile Pb is used in the entire manuscript this specific behavior should be explained in detail before the discussions.* We agree. In fact, Pb is volatile in the atmosphere (especially during fuel burning) however it is low-mobile in dissolved fraction of rivers and lakes where it is present as large-size ferric colloids (Pokrovsky et al., 2016b). These colloids are much less mobile than the soluble low molecular weight fraction of organic complexes of other divalent metals (Zn, Ni, Cd). We revised the text accordingly (L 306-308).

- *Lines 369-370: not agree for Cd, Pb, Sb, Cu and As. Looking at figure, they present a high impact of snow melt water on river for the three latitude zones.* We thank the reviewer for pointing this out and we revised the text accordingly (L 374-377): The impact of snow melt on river export fluxes in spring strongly increases northward for DIC, Cl-, SO_4^{2-}, Na, Mg, Ca, Cr, Ni, Mo, Rb, U whereas Cd, Pb, Sb, Cu, As, W and Cs present a high impact of snow melt water on river for the three latitude zones (Fig. 7)."

- *Lines 394-398: Is it not due to the fact that for these elements, the total concentration in the particulate fraction cannot be correlated to their concentration in dissolved fraction, but should be related to specific labile pools that constitute the mineral fraction? Those latter pools being mainly observed using selective extractions. Especially if most of trace elements are supplied by clay mineral (line 430)?* This is a pertinent remark. We added this alternative explanation in the revised text (L 404 - 406). Unfortunately, we could not run selective extractions on very small amount of solid particles in the WSL snow available in this study.

We thank the reviewer for his/her constructive comments. Care of these and other self-motivated corrections we hope the manuscript can meet the high standards of the journal.

Hope to hear from you soon,
Yours Sincerely, Oleg S. Pokrovsky

Table R1. Compilation of average major and TE concentration in digestion products of blank filters and filters with snow particles.

	Blank filter, µg/L	Snow Particles, µg/L
Element	Average (N = 6)	Average (N = 40)
Li	0.0012	0.091
Be	0.0000073	0.00055
B	0.78	57
Na	11.6	852
Mg	0.098	7.12
Al	0.50	36
Si	12	859
P	0.086	6.29
K	0.70	51.2
Ca	1.2	89.7
Ti	0.014	1.02
V	0.0038	0.279
Cr	0.058	4.25
Mn	0.015	1.09
Fe	0.216	15.8
Co	0.0004	0.0307
Ni	0.0143	1.05
Cu	0.0063	0.459
Zn	0.0686	5.026
Ga	0.00013	0.0094
Ge	0.00006	0.0043
As	0.00044	0.0324
Rb	0.00051	0.0373
Sr	0.0093	0.681
Y	0.00011	0.0083
Zr	0.0046	0.335
Nb	0.00019	0.0141
Mo	0.0024	0.173
Cd	0.00012	0.0086
Sn	0.0032	0.236
Sb	0.0051	0.382
Te	0.00006	0.0045
Cs	0.000023	0.0017
Ba	0.020	1.48
La	0.00029	0.0212
Ce	0.00047	0.0348
Pr	0.000034	0.0025
Nd	0.00033	0.0242
Sm	0.000025	0.0018
Eu	0.000008	0.0006
Gd	0.000030	0.0022
Dy	0.000025	0.0018
Ho	0.000004	0.0003
Er	0.000013	0.0009
Tm	0.000001	0.00011
Yb	0.000011	0.00081
Lu	0.000001	0.00010
Hf	0.000080	0.0058
Ta	0.0011	0.083
W	0.00055	0.0404
Tl	0.000004	0.0003
Pb	0.0034	0.251
Th	0.000078	0.0057
U	0.000029	0.0021