Interactive comment on "Spatiotemporal transformation of dissolved organic matter along an alpine stream flowpath on the Qinghai-Tibetan Plateau: importance of source and permafrost degradation" *by* Yinghui Wang et al.

Anonymous Referee #1

Received and published: 11 July 2018

General comments: The manuscript describes the use of multi techniques (UV, AMS, and FT-ICR MS) to characterize dissolved organic matter (DOM) and discuss the temporal and spatial transformation of DOM along an alpine stream. The methodologies are state-of-the-art, the study area will be of interest to readership, the discussion is appropriate, and the manuscript is well-written. There are some issues, listed below, to address prior to publication.

Specific comments:

Figure 5 was not mentioned in the context, which is my most concern. The "highly unsaturated compounds" was classified into L and H, how to define the classification?

From the distributions of H/C and O/C ratios shown in the van Krevelen diagrams in Figure 5, I trust the assignment of compounds is not credible. The authors directly used the data processing results from the software (EnviroOrg), however, the molecule assignment based on accurate mass value cannot guarantee a correct identification on the mass peak, especially on the high mass end. Most "compounds" classified into the CA area (O/C<0.2) should be incorrect assignment of mass peaks with high mass values. This does not means the data processing and the discussion are wrong, in fact, most published papers in the past years have this problem.

In Table 1 and Table 2, as well as many places in the context, the number of assigned molecular formulas was used to discuss the composition of DOM and the degradation along the stream. This is not rigorous and could lead to misunderstanding for readers both on the mass spectrometry analysis and the environmental interpretation. Not like most other analysis instrument detectors, the limit of detection (LOD) of ESI FT-ICR MS for DOM analysis is uncertain, it partially determined by the most abundant peak in the spectrum. Briefly, less mass peaks does not means the composition of the sample is "simple" and compounds not detected in the sample does not means these compounds must in lower concentration.

I suggest the authors provide some raw mass spectrometry data in the supporting information, such as the broad bound mass spectra, expanded mass scale mass spectra.

Line 220. The numbers include the isotope formulae?

Line 221. Elemental analysis was not mentioned in the context.

Line 232. I don't think it is a good manner to compare the changes in MW and AI with percentage values.