

Interactive comment on “Fast-freezing with liquid nitrogen preserves bulk dissolved organic matter concentrations, but not its composition” by Lisa Thieme et al.

Anonymous Referee #2

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The paper focus on evaluating the effects of fast-freezing with liquid nitrogen and of freezing at -18°C on DOC and DOM contents of water samples from different terrestrial ecosystems. In my opinion the manuscript contains important and useful results for publication. However, the manuscript presents some minor points that should be addressed in a revised version, which are following presented.

1. In section “Abstract”, the last sentence highlight important findings “We recommend fast-freezing with liquid nitrogen for preservation of bulk DOC concentrations of samples from terrestrial sources, whereas immediate measuring is preferable to preserve spectroscopic properties of DOM.” However, the last part of the sentence was also suggested by the study of Santos et al. (2010) for bulk deposition samples (rainwater

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samples), which show that such study should be used in the discussion of the present manuscript.

2. In section “1 Introduction”, page 2, reformulate the sentence “In addition to cDOM in samples from aqueous systems, water-extractable soil organic matter and cDOM in soil pore water samples (Otero et al., 2007; Hur et al., 2014; Traversa et al., 2014) were investigated using EEMs plus PARAFAC as well as isolated humic substances from soil and litter (Kalbitz et al., 1999; D’Orazio et al., 2014).” The study of Otero et al. (2007) did not used the EEMs plus PARAFAC as well as isolated humic substances from soil and litter.

3. In section “1 Introduction”, page 3, I suggest to add also the reference of Santos et al. (2010) to the following sentence “For these reasons it is recommended to directly filter samples after collection and store them in the cold and dark prior to measurement as soon as possible (Spencer and Coble, 2014)”.

4. In section “2 Material and methods”, subsection “2.2 Sampling and sample preparation”, page 4, the first and fourth sentences seems to be contradictory, because it is presented that samples were collected on 17 and 18 June 2014, and then is presented that bottles were biweekly used. Please, clarify.

5. In section “2 Material and methods”, subsection “2.2 Sampling and sample preparation”, page 4: why were not used glass bottles and vials to store the samples? Glass material should be used to avoid contaminations. Blanks of procedure were performed?

6. In section “3 Results”, subsection “3.2 PARAFAC fluorescence components”, reformulate the sentence “The maximum increase was +10% (-18°C) and +12% (N_2)”. Remove the plus sign and extend the sentence with the types of freeze.

7. In section “4 Discussion”, the reference of Santos et al. (2010) should be used together with the reference to Spencer et al. (2007) to the following sentence “This

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is in contrast to the results of Spencer et al. (2007), which could be related to similar fluorescence characteristics, but different chemical composition of proteinaceous fluorescence material from aquatic sources and the solutions from terrestrial ecosystems tested in this study.”

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