

## ***Interactive comment on “Photodegradation and biodegradation of dissolved organic matter on the surface of the Greenland Ice Sheet” by Miranda J. Nicholes et al.***

### **Anonymous Referee #1**

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Specific Comments 1) Line 89: spelling - “remain” instead of “remains” 2) Sections 2.1 and 2.2: Was the pH of the ice and pigment-extracts measured? This would be useful information in the context of e.g. Anesio and Graneli (2003) [Limnol. Oceanogr., 48(2), 2003, 735–744]. 3) Section 2.4 and throughout: I prefer to use the term “microbes” rather than “bacteria” in order to describe both bacteria and archaea. 4) Section 2.4: It would be useful to know the time interval between photodegradation and biodegradation experiment and to have some discussion of potential inhibition of microbial activity by long-lived oxidants which are photochemically produced (e.g. H<sub>2</sub>O<sub>2</sub>). One of the authors has previously shown that these longer-lived oxidants may act as stressors to microbial communities and even inhibit growth [e.g. Anesio

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et al., 2005, doi:10.1128/AEM.71.10.6267–6275.2005]. If the biodegradation experiments didn't start until a few days after the end of photodegradation experiments, then this wasn't an issue. 5) Line 258: The text states “10 % greater absorption at “250nm and between 325 - 600nm.” – this is not evident from Figure 1. Is the Figure correct?

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