Interactive comment on "Technical note: CO_2 is not like CH_4 — limits of and corrections to the headspace method to analyse $p\text{CO}_2$ in water" *by* Matthias Koschorreck et al.

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We thank Mark Trentman and his colleagues for their detailed and constructive comment to our manuscript. We appreciate the independent verification of our calculations – an exercise which was actually asked for by the first reviewer. We also acknowledge their frank recognition that they, like many others, did not consider carbonate speciation in their headspace analysis in the past. This strongly supports our argument that this is a useful contribution to the freshwater community.

Trentman et al. recommend to add a statement that a simpler way of calculation could be used under the assumption that H+ and OH- concentrations are negligible. This

would, as they claim, save computing power and would facilitate integration of the correction into models. We are not really convinced about the necessity of this simplification, given current computing power and our analytical solution can easily be integrated in any process-based models. Why should one use a less precise method in the presence of our solution? Furthermore, the assumption of negligible H+ and OH- might be true for high pH and alkalinity waters, but doesn't necessarily hold under low alkalinity conditions typically found in boreal environments where, for example, [OH-] can easily be of the same magnitude as [CO32-]. We see the strength of our approach in the fact that it can equally be applied to all types of freshwaters.

Besides this, Trentman et al raise some minor issues which we will address in a revision: We will propose clear recommendations which headspace gas should be used under which conditions. We will also clarify notations. We will also include calculation of molar concentrations in our script (already included in the JMP version).

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