

Interactive comment on “UV-induced carbon monoxide emission from sand and living vegetation” by D. Bruhn et al.

Anonymous Referee #1

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This paper presents observations of UV-induced CO release from sand and living vegetation in terrestrial systems and extrapolations of the observed CO emissions rate to estimate global CO burden from these sources. This is a study that adds to the ongoing efforts in understanding the effects of UV radiation on terrestrial systems, which included live vegetation and litter. UV radiation induced CO release from live plants has been observed previously, but only on small scale laboratory observations. This study is a nice addition to previous studies as conducting field observations allows better extrapolation of observations into estimating global burden. More importantly, the careful extrapolation method the authors present in combination with their observations could be valuable for future research. Hence, the topic of this study is timely and relevant to the ‘Biogeosciences’.

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I appreciate the authors’ efforts to address my comments from the referee report and I think the paper is much more improved from the previous version. However, I still have some concerns regarding this paper. First, the introduction is very focused on global CO burden and does not effectively explain the background of the study. Only in the end of the introduction, the authors touch up on CO emissions from living plants and still did not explain what the rationale was behind including sand in this experiment. I previously pointed out that several recent work suggest that trace gas release maybe a direct breakdown from organic compounds within plants and organic matter. This said, I would like the authors to discuss the reasoning behind UV induced CO production from low organic content sand. Second, I appreciate the authors for adding detailed explanation on UV induced CO production from pure sand. However, I would like to see a detailed discussion on why this might happen. Even the small amount of release should have been originated from a source, which previous studies suggest was a breakdown from organic compounds. If the organic compounds are minimal in sand by pre-treatment, than where does CO come from? I think the most interesting part of this study is up-scaling, but I am not very comfortable seeing global scale up-scaling results from an unknown source. I think this paper would be an important contribution with these issues addressed.

Specific comments: P8450L20: Awkward sentence. P8455L21-2: Meaning not clear. P8456L3: Add ‘CO’ in nmol h⁻¹ m⁻² P9457L19: It is Brandt instead of Brand P8458L24: I believe that Derendorp et al., 2011 used litter instead of green leaves. P8459L28-P8460L2: Awkward sentence.

Interactive comment on Biogeosciences Discuss., 9, 8449, 2012.

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