

Interactive
Comment

***Interactive comment on* “Quantifying immediate radiative forcing by black carbon and organic matter with the Specific Forcing Pulse” *by* T. C. Bond et al.**

T. C. Bond et al.

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Reviewer's original text appears in italics; our responses are in normal font.

So far, short-lived climate forcers have been excluded from a regulatory policy because their impact on climate is extremely sensitive to the geographical location of their emissions and their short lifetimes make it difficult to compare their impact with that of a long-lived GHG. The authors have presented a new metric for quantifying and comparing the climate impact of SLCFs to facilitate their inclusion in a climate mitigation policy.

Please see our earlier comment, “Metric or measure?” posted on 5 Sept 2010. This
C9385

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paper does not propose inclusion in climate mitigation policy, or at least not in trading. Until one can quantify the impacts of SLCFs and the benefits of reductions, postulating a trading regime is premature. We have made this explicit in the revision.

1. Since the definition of SFP excludes long-lived GHGs, I find it difficult to assess its usefulness as a metric for including SLFCs in a multi-gas abatement strategy for climate change mitigation, in agreement with Reviewer 1. Perhaps the authors could provide an example of how SFP for BC could be applied for trading.

Please see the comment above.

2. I do agree with other reviewers that the manuscript is very difficult to read and understand.

Many points that were confusing to reviewers were rewritten. More detailed explanations of the modifications are given in the responses to these reviews.

For example, on page 15716 “Some estimates (Jacobson, 2001) . . . IPCC’s fossil fuel estimate of $+0.2 \text{ Wm}^{-2}$,” I had to look up Chapter 2 to understand that the authors were talking about radiative forcing due to fossil fuel BC.

The entire manuscript was re-read to avoid statements with poor context like the one given above. In this specific case, the example was revised to state more of a general principle without giving values.

3. The definition of SFP is extremely confusing in section 2.2. The authors define SFP as the “energy (joules) added within a specific region, rather than power (watts, energy per time) or radiative forcing (watts per area).” In equation 1, if f_s is the net change in energy flux per mass ($\text{Wm}^{-2}\text{g}^{-1}$), then how does one obtain SFP in Joules?

We have added two figures, more discussion and a revised equation in Section 2 and hope that this clarifies matters. We have also changed the definition of f_s so that it has a more physically understandable meaning. Finally, we have revised the figure showing calculation flow.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 15713, 2010.

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