Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC2
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Comment on bg-2020-476

Anonymous Referee #2

Referee comment on "Methane gas emissions from savanna fires: what analysis of local burning regimes in a working West African landscape tell us" by Paul Laris et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2020-476-RC2, 2021

General comments

This paper is potentially an important field-based study focusing on methane gas emissions that can provide useful savanna fire characteristics values suitable for West Africa. The authors quantified, compared, and analyzed these values by fire type and by seasons. Finally, the authors linked their findings to some practical fire management implications. I have a few specific comments that can help to improve the paper. I also suggest the authors carefully check if the reported values in the text are consistent with those in the tables.

Specific comments

Line 28: the value of 0.862 should be better clarified in the text, how is it calculated?

Line 80: From a fire modeling perspective, emission factor was usually simplified defined in most global fire models(1, 2), I am thinking if you can add some “discussion” about the possible implications of your study to the fire modeling field to broaden the interests of this paper.

Line 138: what is the relationship between cool, hot dry season and early, middle, later dry season?

Line 157: clarify what is “time of day”, ignition time?

Line 175: more description of “burn efficiency” is needed

Line 226: delete a replicated “in”

Lines 243, 252: The same symbols and/or units (for example, “Area” in equation 5 but “BA” in equation 6) should be used in equations 5 and 6 to better see their difference.

Line 271: Where did these values come from? I cannot see 4.62%, 4.09% in Table 1.

Lines 306, 308: Similar to the previous comment, 3.47 or 3.3? 2.5 or 2.9? Please check all of the values carefully. If I misunderstood, please clarify this in the text.

Line 308: The authors should also be consistent with the number of digits after the decimal point in the text and in the tables.

Line 311: 313.4 kW/m to 109.0 or 366.9 to 124.8 in Table 3? Did I misunderstand something?

Line 425, 427: 2 or 3 digits after the decimal point? should be consistent.

Tables 1-3: I suggest using “early dry season (EDS)”, “mid-dry season (MDS)”, and “late dry season (LDS)” to replace “early”, “middle”, and “late”, respectively

- S. Hantson *et al.*, The status and challenge of global fire modelling. *Biogeosciences* **13**, 3359-3375 (2016).
- F. Li *et al.*, Historical (1700–2012) global multi-model estimates of the fire emissions from the Fire Modeling Intercomparison Project (FireMIP). *Atmos. Chem. Phys.* **19**, 12545-12567 (2019).