

Interactive comment on “Atmospheric CH₄ and CO₂ enhancements and biomass burning emission ratios derived from satellite observations of the 2015 Indonesian fire plumes” by Robert J. Parker et al.

Anonymous Referee #1

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Using the current 2015/16 El-Nino as a case study, the authors describe the use of GOSAT measurements of vegetation fire smoke plumes to characterise their chemical composition. Building on previous research, the authors demonstrate a technique to calculate the CH₄/CO₂ emission ratio which is indicative of the degree of smouldering to flaming combustion. The authors illustrate the potential of this approach and do so using observations acquired during the recent El-Nino event.

The manuscript is clearly written and concisely describes the approach for calculating the CH₄/CO₂ emission ratio and for assessing the uncertainty. The manuscript is

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suitable for publication in ACP and its content will be of interest to the user community. It is recommended that it be published and included below are some minor comments.

Comments

The higher emission ratios, particularly those in Kalimantan, suggest a larger degree of smouldering to flaming combustion which may result from a greater number of peatland/forest fires. Figure 2 shows that grid cells which contain peatland often have higher fire counts associated with them. Some studies (e.g. Kaiser et al., 2012) have shown that peatland fires can have similar intensities during the day and night [which could partly explain the high fire count in these grid cells]. Do the authors have a view on the possible fraction of peatland/forest fires relative to agricultural burning ?

p1, line 14 : delete 'use'

p2, line 31 : El-Nino

p3, line 3 and 28 : delete the brackets around the year in references

p4, line 31 : delete the brackets around the year in references

P6, line 20 : Include the source of the peatland dataset (used in Fig. 2).

P9, line 2 : Is July used to determine the degree of enhancement (relative to October) as this is defined as the first month of fire activity (Figure 1)?

p10, line 29 and p15, line 8 : van der Werf

p11, line 3 : do not

p13, line 16 : GOSAT

p28 (Fig 7) : delete 'from 1st September region'

p31 (Fig 11) : replace 'Equation X' with 'Equation A13'.

P 31 (Fig 12) : Delete the last line (a largely duplicate sentence).

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