

## ***Interactive comment on “Methane flux, vertical gradient and mixing ratio measurements in a tropical forest” by C. A. S. Querino et al.***

**Anonymous Referee #1**

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GENERAL COMMENTS C. Querino and co-authors have conducted measurements of CH<sub>4</sub> mixing ratio and turbulent fluxes in a tropical forest in Brazil. The measurements described here appear comprehensive and solid, and are described in sufficient detail. The manuscript is generally well written and structured. The results are of interest for the readers of ACP. After minor improvements I would recommend publishing it in ACP.

SPECIFIC COMMENTS Although the measurements are very extensive, you don't make use of them in the best possible way. For instance, the rainfall and soil moisture data are hardly compared to CH<sub>4</sub> fluxes. Hopefully there will be another paper to further interpret this valuable dataset.

In page 5324, line 28 you state that the CH<sub>4</sub> gradients “does not suggest a significant CH<sub>4</sub> production in the canopy.” That's true but could you briefly discuss which other

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factors may modify gradients within the trunkspace and canopy?

How do you end up concluding “The present measurements indicate that organic decomposition at the soil is the most important source for the CH<sub>4</sub> budget at this site.”? From the chamber data mentioned in the end of section 4.1 but not shown in this manuscript? In my opinion it's better to leave out such non-specific results unless they are properly described.

Page 5331, line 24: Maybe it's somewhat too strong to say that the spectral analysis is “proof for the high quality of our EC measurements”. I agree that this comparison supports the quality of your results.

TECHNICAL CORRECTIONS Page 5320, line 3: place only the publication year inside parentheses

Page 5320, line 15: ‘obteined’ should read ‘obtained’

Page 5328, line 13: ‘05’ should read ‘5’

Page 5330, lines 7, 8, 18: primes indicating the fluctuating parts are missing in some variables

Figure 5: Y-axis title should read ‘Height’ instead of ‘High’ in subplots a and b. In the subplots c and d, the Y-axes are titled ‘Level’ but aren't they really the same than in the subplots a and b? It's confusing to change axes within the same figure. Mixing ratio difference is indicated in the X-axes titles of c and d using ‘dCH<sub>4</sub>’ and in the figure caption using ‘ΔCH<sub>4</sub>’.

Figures 6, 7 and 9: I'd prefer seeing the time ticks at e.g. 00, 06, 12, 18, 24 in graphs showing diurnal cycles.

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