

## Authors' comments

Dear Dr. Zhongjun Jia

Thanks for considering our MS acceptable for publication on BG.

Please find here our answers to your last comments

**R 1.** *About the ppm unit. ....Please note "Mole" is a base unit referring to the amount of substance containing as many elementary entities, and is widely used to describe a practical quantity of material and is the link between the microscopic and macroscopic worlds. Therefore, ppm by VOLUME should not have been mol mol<sup>-1</sup>.*

**AU:** Important organizations which deal with measurements like, for example, the International Bureau of Weights and Measures, the International Standards Organization or the U.S. National Institute of Standards and Technology, discourage the use of the "parts-per" notation because "it is not acceptable for use with the SI to express the values of quantities" and because of its ambiguity. This ambiguity does not relate only on the fact that this notation could be referred either to quantities by mass or by volume but also for the ambiguity of their names. For example if you express a quantity in ppb or part per billion depending on the country, billion could be 10<sup>9</sup> or 10<sup>12</sup>. Another example is ppt which sometimes is intended as part per trillion and sometimes part per thousand.

SI-compliant units can be used as alternatives and the International Union of Pure and Applied Chemistry (IUPAC, 1995) recommends the use of the mole fraction (and its submultiples mmol/mol,  $\mu$ mol/mol, nmol/mol etc.) to indicate gas concentrations  
**Reference:** Schwartz and Warneck (1995). "Units for use in atmospheric chemistry". Pure Appl. Chem 67: 1377–1406.

**R.2.** *Table 2 could be moved into supplementary table. Methane oxidation activity was determined in surface soil, but not the deep soils in table 2. Table 2 in the ms was mentioned only once. These data are important evidence in support of the statement 'geothermal soil'. But it is not very necessary to make a separate table. The authors could indeed briefly mention the higher temperature in deeper soils as the note at the bottom of the Table 1, while moving table 2 to supplementary part.*

**AU:** Methane oxidation activity was determined up to a depth of 13 cm at FAV2 (which corresponds to the first layer measure reported in Table 2) and the results clearly indicate that the activity decreases with depth. However Table 2 is still necessary to describe the site in a more complete way. Therefore we accept the suggestion to move it to Supplementary part.

**R.3.** *All Data could be rounded to three significant figures throughout the ms*

**AU:** Ok this has been done.

Best regards

The corresponding Author

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