

Interactive comment on “Analysis of Spatiotemporal variations in mid-upper tropospheric methane during the Wenchuan Ms8.0 earthquake by three indices” by Jing Cui and Xuhui Shen

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Comment 1: However (as authors frequently complain along their manuscript) CH₄ normal seasonal dynamics is apparently not considered in the computation of ALICE index and the concept of anomaly itself not completely developed in the choice of the Reference fields used in the ALICE index computation should be separately computed for different season (e.g. monthly for the same month over 5 years) in order to take into account of CH₄ seasonality avoiding that seasonal variability completely mask the ones possibly related to the considered EQ and to increase the S/N ratio by reducing

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standard deviation. Even if Diff indices can partly compensate for variation of CH₄ due to the seasonal cycle, their absolute values (without any comparison with a reference value and a normal variability like in an ALICE scheme) are not sufficient for appreciating the significance of reported variation as “anomalous”.

Reply: I accept the reviewer's advice. Maybe we did not present clearly. For the three index mentioned in the paper, we have consider the season and caculate the reference fields separately. We have re-written the part 2(Data and method), the Eqs and the parameters have been described again. For all the Eqs used in this paper, N was defined as 5 years, from 2003 to 2007; t is the time of the measurement acquisition (t within a range where the range defines the homogeneous domain of the satellite imagery collected in the same time-slot of the day and period(month) of the year); I was defined as 3 layers (400 hPa, 300 hPa and 200 hPa).

For the Gradient index and Diff index, we have re-written and the result have been recalculated by the author's advice. All this two index have reducing standard deviation in the revised paper.

All the changes can been shown in the changed-marked-manuscript(as a supplement). The changes for this comment mainly in Part 2 (Data and Method), and the changes marked with red color.

Minor comment1: Quality of figures (dimensions and resolutions) should be improved.

Reply: All the figures have been replaced. The resolutions have improved to 600dpi. For the Fig2-Fig10 and Fig12, the dimensions was changed from 5*5 to 5*4 and the label have been reset.

Minor comment2: Acronyms should be in capital letters (e.g. Alice to ALICE).

Reply: For the Fig5-Fig7 and Fig12-Fig13, we have change the Alice to ALICE and the manuscript also changed.

Minor comment3: The quotation of Tramutoli et al, 2013 paper is more appropriate at

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paragraph 10 (after Tronin, 2006, Ouzounov et al. 2007) instead than at paragraph 30.

Reply: We accept the reviewer's advice. Tramutoli et al, 2013 paper have been quoted in Line 3, Page 2 of the changes-marked-manuscript with yellow color. This reference have been deleted in Line 10, Page 4 of the changes-marked-manuscript.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-342/nhess-2018-342-AC1-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-342>, 2019.