

## **Review of the paper**

### **Analysis of Spatiotemporal variations in mid-upper tropospheric methane during the Wenchuan Ms8.0 earthquake by three indices**

**By Jing Cui and Xuhui Shen**

The paper faces very challenging topics related to the anomalous changes of CH<sub>4</sub> atmospheric distribution (based on AIRS retrieval data) in possible relation with the occurrence of Wenchuan earthquake (12 May, 2008).

The paper is well written and the reviewer was delighted by the author's attempt to investigate CH<sub>4</sub> dynamics in the temporal, vertical and horizontal dimensions.

However (as authors frequently complain along their manuscript) CH<sub>4</sub> 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 CH<sub>4</sub> seasonality avoiding that seasonal variability completely mask the ones possibly related to the considered EQ and to increase the S/N ratio by reducing standard deviation.

Even if Diff indices can partly compensate for variation of CH<sub>4</sub> 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"

The reviewer strongly suggests to publish this paper as soon as authors have improved it in the sense I suggested.

Minor comment. Quality of figures (dimensions and resolutions) should be improved. Acronyms should be in capital letters (e.g. Alice→ALICE). The quotation of Tramutoli et al, 2013 paper is more appropriate at paragraph 10 (after Tronin, 2006, Ouzounov et al. 2007) instead than at paragraph 30