

# Emission of C-bearing gases associated with Wenchuan $M_s8.0$

## Earthquake in western Sichuan

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**Abstract.** Fault is the favorable channel for the underground gas migrating upward. The C-bearing gases ( $\text{CH}_4$ ,  $\text{CO}$  and  $\text{CO}_2$ ) underground strongly migrated into the atmosphere along the fault enhanced by the seismic activities. The temporal and spatial distribution characteristics and total variable quantities of C-bearing gases anomalies were obtained using satellite data from AQUA AIRS in order to understand the lithospheric and atmospheric interactions during the seismic cycle. The results showed that large amounts of C-bearing gases emitted from the fault lines with the peak values located over the intersection points where there is maximum stress during and after Wenchuan earthquake. At least 4740 t  $\text{CO}$ , 8549 t  $\text{CH}_4$  and 87.15 Mt  $\text{CO}_2$  were more emitted from Longmenshan fault into the atmosphere compared with the background caused by the occurrence of Wenchuan earthquake during a short period. The C-bearing gas emissions from the fault resulted by the seismic activities are the important parts of geologic C-emission, which cannot be ignored and have an important effect on the atmospheric environment study.

**Keywords:** methane, carbon monoxide, earthquake, hyper-spectrum, anomaly