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A preliminary investigation of methane concentration variations in China by GOSAT

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A preliminary results, that is the spatial distributions variation of CH4 column amounts in China using GOSAT/TANSO observing data, were demonstrated. We collected GOSAT L2 products data (Ver.002/Ver.003) including the parameters of CH4 column, and CH4 dry air mixing ratios (XCH4) during July-October in 2009 as the research announcements users in the GOSAT project. The landuse data which indicate the percentages of landuse type within 1-km grid were used, which were derived from the landuse map of China in 1:100000 map scale. Moreover we collected the data related with the atmospheric CH4 concentration in the gas reservoir reported in the references. In our investigations, a statistical analysis was implemented for CH4 data observed by GOSAT within China. And the spatial and temporal variations of CH4 were analyzed with various landuse types including the farmland, forest, grassland, water cover and built-up areas, the anthropogenic emission sources, and the main gas reservoir in China. The results showed that the total average of XCH4 is 1.72ppmv, XCH4 changed from 1.60 to 1.85, based on statistics of the entire GOSAT observing points from July to August, 2009 in China. The spatial variation of XCH4 generally agreed with the distribution of regional landuse. The timely variation of XCH4 tends to lower from July to October. An interesting result was shown that XCH4 presented higher values in some observing points in Xinjian province, although there are not the large anthropogenic emissions in Xinjiang. It has been reported that the average ratio of atmospheric CH4 over a condensed gas reservoir in Xinjian was heavier than the global average based on the ground survey from the related reference about the CH4 concentration, which may be caused by seepage and diffusing of CH4 from the condensed gas reservoir. When compared XCH4 observed points by GOSAT nearby the condensed gas field compared with the other points at the distance 394 km off the gas field, the results showed that XCH4 over the observing points located at the gas field was higher than that at 394 km off it, and XCH4 at the gas field temporally presented a lower trend from July to October. The temporal variation of XCH4 maybe related with the temperature changes of consumed soil surface caused by the seepage and diffusing of methane from the condensed gas reservoir. This paper only presented the preliminary results because there are not enough GOSAT observing data available still since IBUKI/GOSAT was launched only just one year. We will implements qualitatively and quantitatively assessment the temporal and spatial variations of CH4 column amounts with the accumulation of GOSAT observing points in further.