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SCIAMACHY observed changes in the column mixing ratio of methane over the Indian region and a comparison with global scenario

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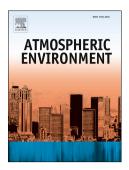
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1 SCIAMACHY observed changes in the column mixing ratio of methane over the Indian

- 2 region and a comparison with global scenario
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- 8 Abstract

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The trends in the column averaged mixing ratio of methane (XCH₄) over the Indian region during 2003-2009 periods were studied using the SCanning Imaging Absorption spectroMeter for Atmospheric CHartographY (SCIAMACHY) observations. Considering the sensor degradation, the trends were analyzed for 2003 to 2005 and 2006 to 2009 separately. Over India, the trend in XCH₄ varied from 5.2 to 7.6 ppb per year after 2005, exhibiting a 2-4 fold increase compared to 2003-2005. While the increase over Northern parts of India is attributed to increasing CH₄ emissions from rice cultivation and livestock population, those over Southern regions are due to increased oil and gas mining activities. A comparison of these trends with those over most of the hotspot regions over the globe revealed that those regions exhibited higher growth rates of XCH₄ compared to Indian regions during 2006-2009. The seasonal patterns of XCH₄ and near-surface CH₄ at selected global network stations were also examined in detail. This analysis revealed hemispheric difference and varying seasonal patterns suggesting the inhomogeneous vertical distribution of CH₄. The observed differences in the seasonal patterns of near-surface CH₄ and XCH₄ suggest that the surface emissions need not replicate at higher

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