

Methane isotope measurements of CARIBIC air samples and preliminary inter-laboratory comparisons

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We analyzed air samples collected in the upper troposphere over South Asia by the Civil Aircraft for the Regular Investigation of the atmosphere Based on an Instrument Container (CARIBIC) for carbon and hydrogen isotopic ratios of methane. Subsets of the CARIBIC air samples were measured at two laboratories (University of California Irvine and Utrecht University), and the merged dataset covers the period from March 2000 to April 2001. Six air samples were analyzed at both laboratories to adjust inter-laboratory measurement offsets. To compare CARIBIC data with an independent upper tropospheric dataset, we further carried out an intercomparison exercise between Utrecht University and Tohoku University. After being adjusted for the laboratory offsets, the CARIBIC methane isotope data show a clear seasonal decrease with elevated methane concentration in the summer monsoon period, which plausibly reflects enhanced biogenic methane emissions in South Asia in the season. We also present preliminary intercomparison results among the 3 laboratories involved.