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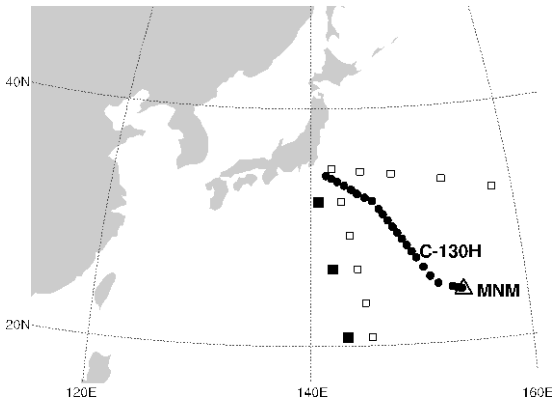

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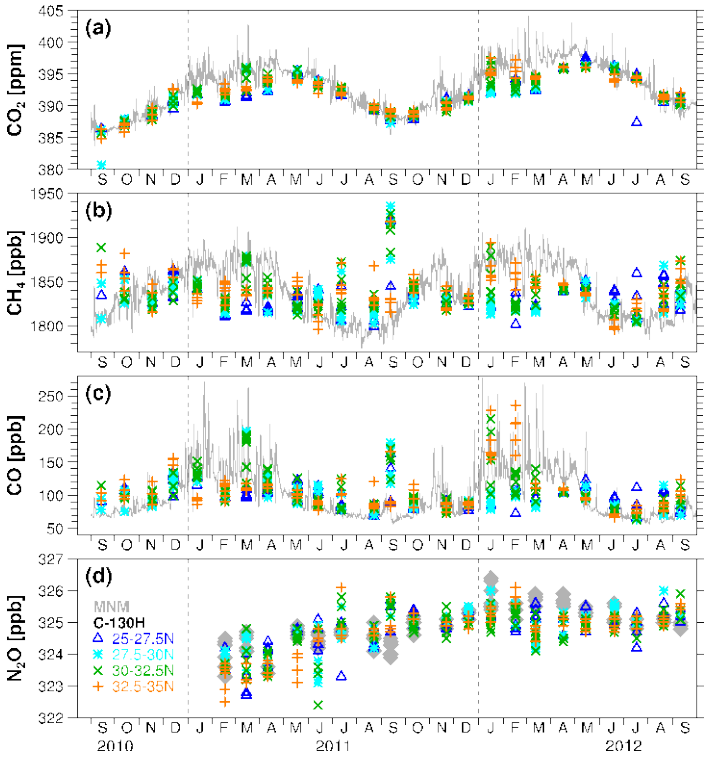
Figure 1. Flask sampling points of the C-130H aircraft observation (closed circles) and CONTRAIL (closed and open squares).



→Figure 2. Time series of observed concentrations of CO_2 (a), CH_4 (b), CO (c) and N_2O (d). Blue, cyan, green and orange symbols denote observations obtained by the level flights (5–7 km) of C-130H. Gray lines and diamonds denote observations by measurements at the Minamitorishima (MNM) ground-based station.

- Seasonal variations of carbon dioxide (CO_2), methane (CH_4), carbon monoxide (CO) and nitrous oxide (N_2O) in the mid-troposphere over the western North Pacific are investigated using air samples collected onboard a C-130H aircraft between Atsugi Base and Minamitorishima.
- The C-130H aircraft observed high CH_4 concentration events in the mid-troposphere concomitantly with high CO concentrations, for both winter–spring and summer-fall. Average enhancement ratios of CH_4 to CO suggest that the high CH_4 concentrations originated primarily from fossil fuel combustions in winter–spring, while there could be an additional contribution from increased biogenic sources during summer–fall.
- Because a surface station rarely observed the summer–fall high CH_4 concentration values in the mid-troposphere, the aircraft measurements could provide a powerful constraint on the CH_4 emission estimates for Asia, in addition to that provided by the surface measurements.