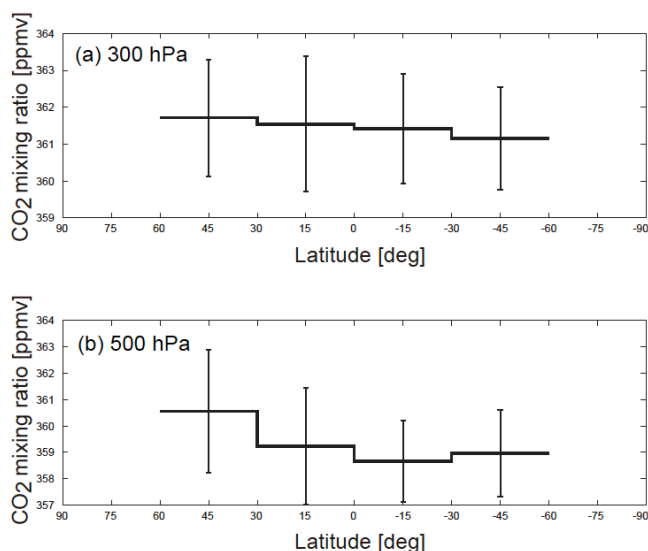


Ota, Y., and R. Imasu, 2016: CO<sub>2</sub> Retrieval using thermal infrared radiation observation by Interferometric Monitor for Greenhouse Gases (IMG) onboard Advanced Earth Observing Satellite (ADEOS). *J. Meteor. Soc. Japan*, **94**, 471-490.

<https://doi.org/10.2151/jmsj.2016-027>



← Figure 1. Latitudinal distribution of zonal mean CO<sub>2</sub> volume mixing ratios calculated from IMG retrievals in April 1997. Vertical bars show the variation (standard deviation) in each latitudinal zone (a) at pressures of 300 hPa and (b) at 500 hPa. Positive and negative values of latitude respectively denote northern and southern latitudes.

- CO<sub>2</sub> concentrations in the upper troposphere were retrieved from thermal infrared spectra as observed by the only spaceborne hyperspectral sounder launched in the 1990s: the Interferometric Monitor for Greenhouse gases (IMG) onboard the Advanced Earth Observing Satellite (ADEOS).
- The effective optical path difference (EOPD) of IMG was evaluated in order to optimize the actual instrumental line shape function of IMG in orbit.
- CO<sub>2</sub> retrieval method was based on maximum *a posteriori* (MAP) retrieval method and on *a priori* temperature field of ERA-40 re-analysis meteorological data. CO<sub>2</sub> retrieval noises of the MAP retrieval were estimated respectively as 2.5% and 2.0% at pressure levels of 500 hPa and 300 hPa.
- The CO<sub>2</sub> retrieval method was applied to IMG data measured in April, 1997. Although assuming uniform CO<sub>2</sub> concentration as *a priori*, the results showed that latitudinal gradient of zonal mean concentration was consistent with climatological features presented by previous studies at pressure levels of 500 hPa and 300 hPa.