O-05

Session 3) Isotopologues in Atmosphere: CH_4, CO and CO_2

Overview of isotopologues observation from Space with satellite

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Satellite remote sensing from space provide an opportunity of global observations of molecular isotopologues in the earth's atmosphere. However, these spectroscopic remote sensing methods generally have a precision and an accuracy about 20-30% for the observation of atmospheric trace components. That has made difficult to obtain the scientific information of isotopic ratios, often requiring a few permil for the accuracy and precision, from satellite observation.

We have been trying to discuss $\delta^{18}OOO$, $\delta^{17}OOO$, $\delta^{13}CO_2$, δD_{H2O}, δD_{CH4} in the Earth's atmosphere from satellite observation with unique high sensitivity observation as well as statistical approach by using satellite big data. The satellites we have used are, for example, SMILES: Superconducting Submillimeter-Wave Limb Emission Sounder from International space station to discuss ozone isotopologues between middle stratosphere and lower mesosphere, GOSAT: Greenhouse gases Observing SATellite to discuss global $\delta^{13}CO_2$. In the presentation, I would like to show you the current overview of the isotopologues observation from satellite, and discuss detailed method of observation, data analysis, and scientific problems. I also would like to introduce you the isotope observation of atmosphere of Jupiter and its Icy Moon by using SWI: Submillimetre-wave Instrument on Jupiter Icy Moon Explorer, which is ESA project.

References

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