



Contribution ID: 83 Contribution code: PSA-19

Type: Poster

Using ^{14}C to trace the temporal variation and spatial distribution of fossil fuel CO_2 in Guilin and its influencing factors

Monday, 21 October 2024 16:55 (20 minutes)

In the context of today's global warming, China has proposed the carbon emission reduction target of carbon peaking and carbon neutrality, while the increase in atmospheric carbon dioxide concentration is mainly caused by man-made fossil fuel emissions. Radiocarbon isotope (^{14}C) is the most effective tracers of fossil fuel CO_2 (CO_2^{ff}). In this study, 5-liter air bags and PQ200 instrument were used to collect atmospheric and $\text{PM}_{2.5}$ samples on the roof of the experimental building of Guangxi Normal University for a continuous year from 2023 to 2024. The leaves of sticktight (an annual plant) were sampled at 23 sites in Guilin in November 2023. A compact single-stage accelerator mass spectrometer (GXNU-AMS) was used to analyze the $\Delta^{14}\text{C}$ content of these three types of samples in order to track the temporal variation and spatial distribution of CO_2^{ff} in Guilin and discuss its influencing factors. It can provide a scientific basis for local governments to implement effective carbon emission reduction measures.

Student Submission

Yes

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Session Classification: Poster Session A

Track Classification: Applications of Atmospheric and Environmental C-14