

New way to measure sulfate particles

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The University of Maryland and the National Institute of Standards and Technology created an improved technique to measure sulfur isotopic ratios.

Sulfate particles in the atmosphere scatter and absorb sunlight, provide "seeds" for cloud formation, and affect the reflectivity and radiance of clouds, and thus the temperatures at the Earth's surface.

Atmospheric sulfate comes from natural sources, including oceans and volcanoes, but a large fraction comes from the burning of fossil fuels. Researchers can distinguish between various natural and anthropogenic sources in snow by measuring sulfur isotopes -- forms of the element with different numbers of neutrons.

The standard analysis technique, gas-source isotope ratio mass spectroscopy requires about 9 pounds of snow and ice, but the cycling of sulfur in the atmosphere is dynamic and variable, so samples that large blur seasonal changes, the researchers say.

The new analytical tool is based on thermal ionization mass spectrometry, which requires smaller samples, make it possible to distinguish seasonal changes in sulfur particulate composition.

The findings were presented at the National Meeting of the American Chemical Society and are scheduled for publication in Rapid Communications in Mass Spectrometry.



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