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## High resolution sulfur isotopes from ice cores: improved estimates of the volcanic forcing of climate

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The record of the volcanic forcing of climate over the past 2500 years is reconstructed primarily from sulfate concentrations in ice cores. Of particular interest are stratospheric eruptions, as these afford sulfate aerosols the longest residence time and largest dispersion in the atmosphere, and thus the greatest impact on radiative forcing. Sulfur isotopes can be used to distinguish between stratospheric and tropospheric volcanic sulfate in ice cores since stratospheric sulfur aerosols are exposed to UV radiation which imparts a mass independent fractionation (Savarino et al., 2003). Thus, sulfur isotopes in ice cores provide a means to identify stratospheric eruptions and calculate the proportion of sulfate deposited from a volcanic event that came the stratosphere, allowing us to refine the historic record of explosive volcanism and its forcing of climate. Here we present high-resolution (sub-annual) sulfur isotope data from both Greenland and Antarctica across a suite of unidentified eruptions from the anomalously cold decades of the 530s, 1450s and 1600s to investigate the climate forcing potential of these eruptions.

Savarino, J., Romero, A., Cole Dai, J., Bekki, S., & Thiemens, M. H. (2003). UV induced mass-independent sulfur isotope fractionation in stratospheric volcanic sulfate. *Geophysical Research Letters*, 30(21). <http://doi.org/10.1029/2003GL018134>

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