

Leipziger Meteorologisches Kolloquium

Donnerstag, 12.01.2023, 16.00 Uhr

LIM, Vor dem Hospitaltore 1, Seminarraum und
online (<https://uni-leipzig.zoom.us/j/63684640913?pwd=cGlSbWcrSFRhYlJLQWISZkplMmtwZz09>)

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Volcanic radiative forcing: past and future

Volcanism is a major driver of climate variability and has played a critical role in the long-term evolution of Earth's atmosphere and habitability through the release of gases including sulfur species, water, carbon dioxide, and halogens. In this talk, I will summarize my work on volcanic radiative forcing exerted by volcanic eruptions of different magnitudes in the past and in the future. The general mechanisms by which volcanic eruptions affect climate are well understood today. Until recently, research efforts have mainly been focused on the direct radiative, dynamical and chemical effects of sulfate aerosol particles formed by large-magnitude explosive eruptions such as Mt. Pinatubo in 1991. However, eruptions much smaller in magnitude than 1991 Mt. Pinatubo routinely decrease the transparency of the stratosphere to a degree that a cooling effect is discernible in upper tropospheric temperature measurements. I will make a case for the need to include these small-magnitude eruptions in climate model simulations. In addition, I will show that global warming can affect both eruptive column dynamics and the volcanic sulfate aerosol lifecycle and thus the radiative forcing and climate effects of future volcanic eruptions.