

## Popular Scientific Summary

Today it is well known that greenhouse gases emitted by mankind contribute to global warming. What is less known to the general public is that major volcanic eruptions can lead to global cooling. Volcanic eruptions do not only emit ash, but they also emit sulfur dioxide. When this gas gets emitted straight into the higher atmosphere (i.e. the stratosphere), it turns into sulfate particles that act as a shield against incoming solar radiation. If the eruption is strong enough this might lead to global cooling. For example, in 1991 there was a major eruption of Mount Pinatubo that caused cooling of the global climate years after the eruption.

Climate models have been bad at representing these particles and their cooling properties. Therefore, the global warming has been overestimated, and as a result, the contribution by greenhouse gases has been underestimated. Hence, studying volcanic aerosols and their radiative properties are crucial to fully understand climate change.

In this project the stratospheric volcanic aerosols after the eruption of the Raikoke volcano in 2019 have been investigated. This has been done using satellite data from the CALIPSO satellite that was launched in 2006 by NASA and CNES. The goal was to see how the eruption affected the stratosphere and its radiative properties.