

OCTOBER 30, 2018 **REPORT**

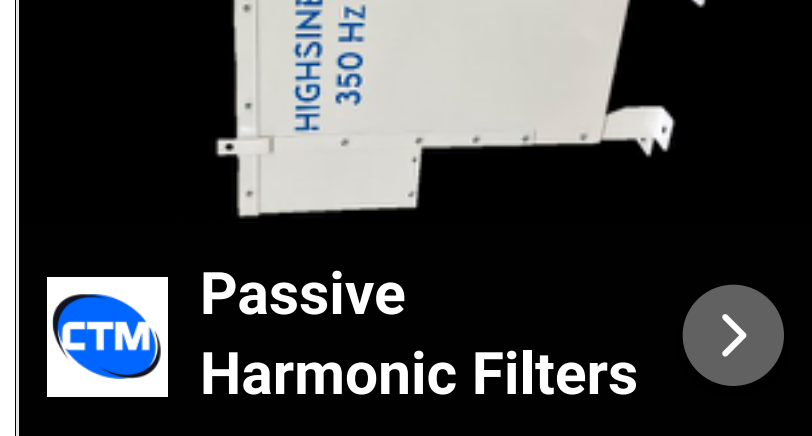
Models suggest injection of sulfate aerosols into the stratosphere could have unintended consequences

by Bob Yirka · Phys.org



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A team of researchers from the National Center for Atmospheric Research, the Pacific Northwest National Laboratory and Cornell University has found via modeling that injecting sulfate aerosols into the stratosphere could have unintended negative consequences. In their paper published in the journal *Nature Geoscience*, the group describe their models and what they showed.



As the planet continues to heat up due to the collective refusal to stop pumping greenhouse gases into the atmosphere, scientists continue to look for other ways we might save ourselves. Instead of curbing gas emissions, it might be possible to cool the planet in other ways, such as by injecting sulfate aerosols into the stratosphere. The idea is to mimic the cooling effect of volcanic eruptions.

Regarding such an approach, researchers have proposed that the aerosols be dispersed from balloons or airplanes at approximately 15 and 30 degrees latitude on both sides of the equator. The desired results would be reduced surface warming and a positive change in the temperature gradient.

To learn more about what might happen to the planet if such an experiment were actually carried out, the researchers ran 20 computer simulations to demonstrate the impact of adding sulfate aerosols to the stratosphere in the proposed manner.

The researchers report that overall, the models showed the desired cooling impact. But they also showed something less helpful—reduced global rainfall. The models showed that the changes in rainfall would not be uniform, either; some areas would get less than others. And as some of those areas, such as the North Atlantic, received less rainfall, the ocean would experience an increase in salinity, which would make the water denser. That denser water would then have an impact on the Atlantic Meridional Overturning Circulation, burying more heat in the deep ocean. The net result would be a warmer ocean, more polar melting and faster rising sea levels.

The researchers conclude their report by pointing out that the true impact on the planet of such an endeavor could not be shown by computer modeling—at least not with complete confidence.

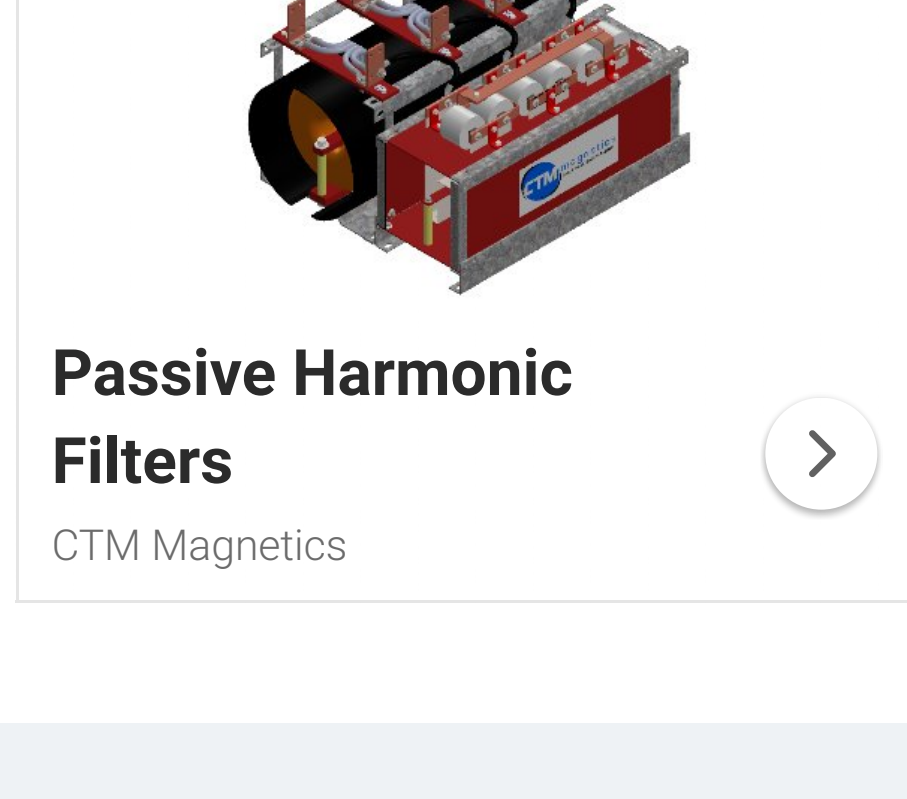
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More information: John T. Fasullo et al. Persistent polar ocean warming in a strategically geoengineered climate, *Nature Geoscience* (2018). DOI: 10.1038/s41561-018-0249-7
Journal information: [Nature Geoscience](#)

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