



Jim Lee Interviews Head of FAA/NASA Climate Change Research

3/28/2017 - From Jim Lee:

I will be interviewing the head of the FAA/NASA Aviation Climate Change Research Initiative (ACCRI), who is also the head of the ACCESS test flights, possibly this week! Heads are going to roll!

Dr. Halthore,

Thank you for that excellent conversation on the phone earlier. Here are the references we will be discussing. I hope we can set up a Google Hangout (like Skype) interview this week sometime if possible.

Thank you so much for the opportunity.

REFERENCES

"Both aspect offer the potential for aviation to reduce the climate impact of aviation - less soot emissions, less warming and more cooling contrails; predictable for operational planning"

Intentional Contrail Cirrus Geoengineering

Ulrich Schumann, German Aerospace Center, Recent research results on the climate impact of contrail cirrus and mitigation options, ICAO Colloquium on Aviation and Climate Change 2010

http://www.icao.int/Meetings/EnvironmentalColloquium/Documents/2010-Colloquium/1_Schumann_ContrailMitigation.pdf

<https://weathermodificationhistory.com/index.html?post=intentional-contrail-cirrus-geoengineering>

"Accidental" Geoengineering? Chuck Long, CIRES - Dec 2015

Airlines creating subvisual ice haze

<http://web.archive.org/web/20151217134106/http://cires.colorado.edu/index.php?clD=1824>

<http://www.smithsonianmag.com/science-nature/airplane-contrails-may-be-creating-accidental-geoengineering-180957561/?no-ist>

<http://www.bbc.com/news/science-environment-35109198>

<https://weathermodificationhistory.com/index.html?post=accidental-geoengineering>

Contradicts carbon black as cloud seeds in “persistent” cirrus, says mostly man made metals:

Science 14 June 2013: Vol. 340 no. 6138 pp. 1320-1324 DOI: 10.1126/science.1234145

“Clarifying the Dominant Sources and Mechanisms of Cirrus Cloud Formation”

<http://www.sciencemag.org/content/340/6138/1320.abstract>

CIRRUS CLOUD MITIGATION

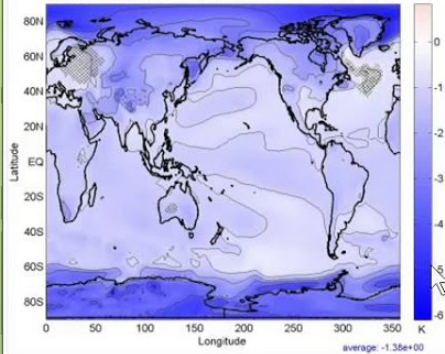
Trude Storelvmo, Yale University, New Haven, CT; and W. R. Boos and N. Herger, Cirrus cloud seeding: a climate engineering mechanism with reduced side effects? Philos Trans A Math Phys Eng Sci. 2014 Dec 28;372(2031). pii: 20140116. doi: 10.1098/rsta.2014.0116.

<http://www.ncbi.nlm.nih.gov/pubmed/25404685>

Climate response to cirrus seeding

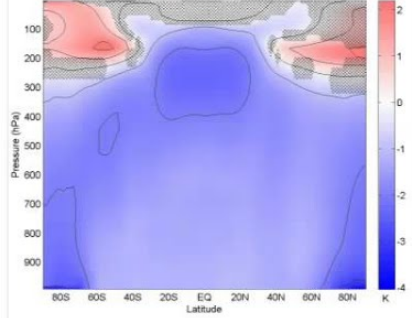
Cooling from seeding 45% of the globe with efficient IN

Change in Surface Temperature, SEEDING-CONTROL



Global mean cooling: 1.4 K,
polar amplification factor of 2.5,
comparable to $2\times\text{CO}_2$ response

Change in Atmospheric Temperature, SEEDING-CONTROL



Cirrus seeding cools throughout
the troposphere, and warms
throughout the stratosphere
(mirrors CO_2 response)

Storelvmo, Boos & Herger (2014)

<https://weathermodificationhistory.com/index.html?post=cirrus-cloud-seeding>

<https://climateviewer.com/2015/03/23/on-the-climate-response-to-cirrus-cloud-seeding-wxmod-2015/>

Laser vaporization of cirrus-like ice particles with secondary ice multiplication

<http://advances.sciencemag.org/content/2/5/e1501912>

Zapping clouds with lasers could tweak planet's temperature

<https://www.sciencenews.org/article/zapping-clouds-lasers-could-tweak-planet%E2%80%99s-temperature>

EPA HEARING ON JET POLLUTION

Geoengineering Activists vs. the US EPA (Hearing 2015)

<https://weathermodificationhistory.com/index.html?post=epa-flight-pollution-hearing>

Jim Lee, "My Speech to the EPA about Flight Pollution,"

<https://climateviewer.com/2015/08/09/my-speech-to-the-epa-about-flight-pollution/>

HISTORY REPEATING ITSELF

Two States Sue Airlines Over “Smoke Pollution of the Skies” 1972

"70% reduction in particulates"

<https://weathermodificationhistory.com/index.html?post=states-sue-airlines-over-smoke-pollution-of-the-skies-1970>

New Fuss Raised Over Jet Trails - 1958

<https://weathermodificationhistory.com/index.html?post=contrail-cirrus-covers-palm-springs-1958>

FUEL SULFUR CONTENT (FSC) GEOENGINEERING

NASA ACCESS-II tests Sulfur-Doped Jet Fuel

<https://weathermodificationhistory.com/index.html?post=access-ii-flights>

Bruce Anderson, “Alternative-Fuel Effects on Contrails & Cruise Emissions (ACCESS-2) Flight Experiment.” NASA LaRC and the ACCESS-II Science and Implementation Teams, January 2015;

<http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20160006477.pdf>

Richard H. Moore et al. “In-Situ Measurements of Contrail Properties Measured During the 2013-2014 ACCESS Project,” 14th Conference on Cloud Physics, July 2014.

<https://ams.confex.com/ams/14CLOUD14ATRAD/webprogram/Paper250908.html>

FSC QUOTES

“Use commuter aircraft fuels doped with aerosol generators”

<http://youtu.be/o3rAZ8Fmc0Q?t=15m50s>

“dissolved or suspended in their jet fuel and later burned with the fuel to create seeding aerosol, or (2) injected into the hot engine exhaust, which should vaporize the seeding material, allowing it to condense as aerosol in the jet contrail”

http://iopscience.iop.org/1748-9326/4/4/045102/pdf/1748-9326_4_4_045102.pdf

“Options for dispersing gases from planes include the addition of sulfur to the fuel, which would release the aerosol through the exhaust system of the plane, or the attachment of a nozzle to release the sulfur from its own tank within the plane, which would be the better option.”

<http://climate.envsci.rutgers.edu/pdf/GRLreview2.pdf>

“The particles may be seeded by dispersal from seeding aircraft; one exemplary technique may be via the jet fuel as suggested by prior work regarding the metallic particles. Once the tiny particles have been dispersed into the atmosphere, the particles may remain in suspension for up to one year.”

<http://www.freepatentsonline.com/5003186.html>

A potential delivery mechanism for the seeding material is already in place: the airline industry. Since seeding aerosol residence times in the troposphere are relatively short, the climate might return to its normal state within months after stopping the geoengineering experiment. The main known drawback to this approach is that it would not stop ocean acidification. It does not have many of the drawbacks that stratospheric injection of sulfur species has.

<http://iopscience.iop.org/1748-9326/4/4/045102>

“Direct detection of total sulfuric acid (SA) has been achieved for the first time in the plume of a jet aircraft in flight. The measurements show the same SA signatures for the case when SA was injected directly into the exhaust jet and the case when sulfur was provided to the engine with the fuel.”

<http://onlinelibrary.wiley.com/doi/10.1029/98GL00512/pdf>

“Applying high FSCs [fuel sulfur content] at aviation cruise altitudes combined with ULSJ [ultra-low sulfur jet fuel, aviation biofuel] fuel at lower altitudes result in reduced aviation-induced mortality and increased negative RE compared to the baseline aviation scenario.”

Kapadia, Z. Z., Spracklen, D. V., Arnold, S. R., Borman, D. J., Mann, G. W., Pringle, K. J., Monks, S. A., Reddington, C. L., Benduhn, F., Rap, A., Scott, C. E., Butt, E. W., and Yoshioka, M.: Impacts of aviation fuel sulfur content on climate and human health, Atmos. Chem. Phys. Discuss., 15, 18921-18961, doi:10.5194/acpd-15-18921-2015, 2015.

<http://www.atmos-chem-phys-discuss.net/15/18921/2015/acpd-15-18921-2015.html>

“Another technique examined was the use of commercial passenger aircraft flying at high altitudes to inject sulphate aerosols, emitted by aviation fuel, into the stratosphere.

http://web.archive.org/web/20150314160918/http://www.apropos.fi/Tiedostot/Tiedostot/FICCA/FICCA%2016.04.2013/Posters/FICCA_poster_Partanen_COOL.pdf

<http://web.archive.org/web/20150314161010/http://www.aka.fi/en-GB/A/Programmes-and-cooperation/Academy-programmes/Etusivun-elementit/Researchers-look-into-geoengineering-possibilities/>

<https://weathermodificationhistory.com/index.html?post=ficca-cool>

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