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Fly lower to cut climate impact

By Paul Rincon

BBC News Online science staff

Flying aircraft 6,000 feet (1.8 kilometres) below current altitudes could help curb the contribution to climate change made by aircraft.

UK scientists say this would result in a 47% reduction in contrails, the exhaust streams produced by aircraft.



The aviation industry wants to cut its emissions

Contrails can evolve into cirrus clouds that may trap terrestrial radiation, driving up global temperatures.

The suggestion comes out of computer modelling at Manchester Metropolitan University and other institutions.

"Climate change is a real, measurable phenomenon," said Manchester's Professor David Lee, an author of the research who was speaking at the Science Media Centre in London.

Cirrus clouds - typically thin and wispy - occur about 20,000 feet (6 km) over the Earth's surface, and above. They are composed of ice crystals that form through the freezing of super-cooled water droplets.

3D simulation

The researchers came to their conclusions by developing a computer simulation model of the total global aircraft traffic. This took account of different flying routes, altitudes, flight frequencies, and aircraft types.

They also used meteorological data to calculate where the aircraft would hit conditions favourable for contrails, or condensation trails. The exhaust clouds form more frequently where there is high atmospheric humidity.

This simulation was then played through a 3D computer grid which revealed the contrail coverage produced by the virtual air traffic.

This can be used to calculate the contrail contribution to the total climate change effect from aviation which is assessed using a measure known as radiative forcing.

This describes how an environmental process affects the

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energy balance of the Earth and atmosphere.

The team tried several scenarios in which they looked at the effect of flying aircraft 2,000, 4,000 and 6,000 feet below their current levels. Flying aircraft at 6,000 feet below their current altitudes reduced the contrail coverage by 47% in the simulation.

Conventional altitudes for commercial aircraft are between 20,000 (6 km) and 40,000 feet (12 km).

Icy clouds

Although contrails have been observed evolving into cirrus clouds, there are currently no figures on their contribution to the formation of cirrus clouds globally.

Dr Paul DeMott, an atmosphere scientist at Colorado State University, US, was cautious about the factors behind cirrus cloud formation on a worldwide scale.


"I think there is at least some potential impact of aircraft causing more cloudiness, but you have to have the right conditions for cirrus cloud formation," he said.

"I think it's fair to say, we're still not completely certain about the direction or magnitude of cirrus clouds on [climate change]. We need to know more about their distribution in the atmosphere," he added.

The study is a joint project between nine different partners across Europe, including Manchester Metropolitan University, the German Aerospace Centre and the University of Oslo.

The UK Government's white paper on the future of aviation, expected next month, will outline a 30-year strategy for the aircraft industry.

The industry has been looking at options for stabilising emission levels from aircraft in line with projected passenger growth of 3-5% over a similar period.

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