

## Contrail Catcher System (CCS) for Mitigating Global Warming

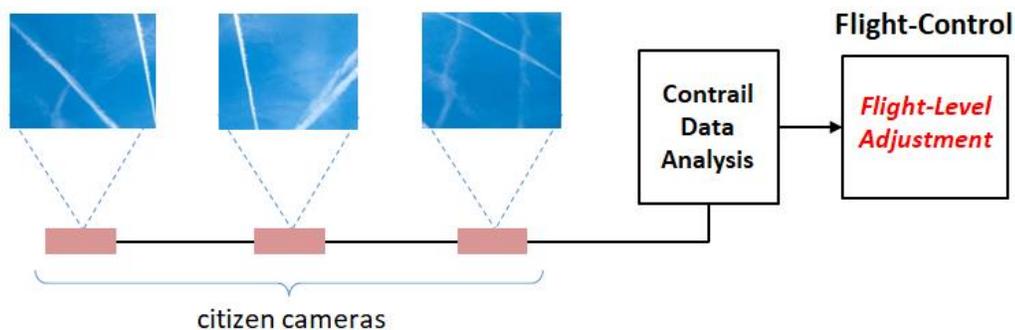
This novel system can be used by volunteer amateur meteorologists and volunteer flight trackers to collect data on the presence of contrails in the overhead airspace. The system may be able to eliminate up to 67% of contrails which in turn may result in about 1.5% reduction of Earth's anthropogenic global heating.

Contrails absorb and reflect 33% of outgoing thermal radiation back to the earth, causing human made global warming. According to the United Nations International Panel on Climate Change (IPCC), contrails or Aircraft Induced Clouds (AIC), contribute 2% of Earth's anthropogenic global heating. Contrails are generated by the soot and water vapor emissions of jet engines under specific atmospheric conditions appearing at certain altitudes. Increasing an aircraft flight level by as little as 2000 feet, for aircraft likely to generate contrails, can eliminate an estimated 67% of contrails. The additional fuel costs of the 2000 feet climb is negligible.

A geographically distributed network of cameras acquires sky images and tracks contrails in the images. The contrail data from the distributed network is pooled, analyzed and made available to scientists, researchers, and engineers on a publicly available web portal. The contrail data is used to prevent the formation of contrails by implementing flight protocols, such as increasing the cruise flight level, for the flights that are likely to form contrails.

There are estimated to be 100,000 backyard weather stations (run by amateur meteorologists known as "citizen scientists") in the U.S. in the Weather Underground network and 14,000 volunteers in the FlightAware ADS-B network. These amateur meteorologist can act as data collection agents by crowd-sourcing the contrail data (e.g. presence and duration) from contrail tracking devices. The devices collect data only for the period when an aircraft transits the overhead airspace and a contrail is present. The contrail-data is used to determine the flights which are likely to form contrails and to reassign flight levels (e.g. increase flight level) so as to avoid the further formation of contrails. This system can significantly reduce global heating.

### *Geographically Distributed Network of Citizen Cameras*



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