

Evaluating the Persistence Factor for Aircraft Contrail Prediction

Task for a *Project*

Background

Aviation-induced cloudiness (due to contrails, persistent contrails and contrail cirrus) is responsible for about half of the warming effect of aviation (depending on the metric). We see contrails in the blue sky. Briegert (2024) had already a closer look at the contrails in the sky in the frame of his project. See <http://library.ProfScholz.de>. Many pictures of contrails got collected and data has been stored in a 6 GB zip-file, but most data is not yet evaluated. Depending on relative humidity and temperature a "Persistence Factor", R needs to be calculated. For contrails, we differentiate three groups, defined so far as: $R < 0.5$ no contrail, $R = 0.5 \dots 1.3$ transient contrail, $R > 1.3$ persistent contrail. Your task is to evaluate collected data. You may also collect your own data in addition. Can you confirm the borders for R of 0.5 and 1.3?

Task

Task of this project is to evaluate collected data of contrails and to compare their existence and persistence with calculation. The subtasks are:

- Summarize contrail fundamentals.
- Evaluate collected data, classify contrails and compare them with results from contrail prediction. What seems to be the reason if observation and prediction do not match? Confirm the borders of the Persistence Factor, R . Modify them if necessary.
- Check for new open tools, helpful for contrail prediction.

The report has to be written in English based on German or international standards on report writing.