

Geosci. Model Dev. Discuss., referee comment RC2
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Comment on gmd-2022-220

Anonymous Referee #2

Referee comment on "Predicting the climate impact of aviation for en-route emissions: The algorithmic climate change function submodel ACCF 1.0 of EMAC 2.53" by Feijia Yin et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2022-220-RC2>, 2022

The paper deals with an interesting approach to the determination of the climate impact on air traffic. The abstract lacks motivation, results and applicability. The first sentence of the abstract has no content. Already in the abstract, there are numerous unexplained abbreviations.

In the introduction, the motivation is based on a 4-year-old prediction. This should be made acute. The state of the art is completely missing. Instead, we find a paragraph with far too many self-citations, which summarises preliminary views of the authorship. The work is based on Climate costs functions CCF, which is not comprehensibly derived in any of the sources mentioned. The errors of the CCF are not discussed. The transferability to other time periods is very questionable and is not discussed. The scientific amount of Figure 1 to the paper is not made clear. Equations 1 and 2 were copied from Manen and Grewe and should be properly cited. The constant factor 0.0151 K/W/m² in line 244 should be critically questioned and its error should be critically discussed. The sole distinction between day and night is not sufficient in the context of the Contrail RF and ignores cooling effects during sunrise and sunset. The extreme heterogeneity of the contrail CCFs in Figure 6 supports the assumption that the developed CCFs are extremely weather-dependent and thus not applicable to other time periods. Please explain why the effectiveness in line 285 is not included in the CCF and derive the uncertainty of the effectiveness. In Figure 9, your definition of a cost-optimal and a climate-optimal trajectory is absolutely necessary to understand the procedure. The dents and ripples in the optimised trajectories in Figures 10 and 11 should definitely be explained and critically questioned. All results and assumptions should have been critically questioned and discussed in the conclusions at the latest. An error analysis of such a strongly empirically driven model is absolutely necessary.