RC2:

In this paper, the WRF model is used to simulate the transport of CO2 and CH4 for a 2-month period in 2018 at 5-km scale over Europe, with particular focus over a coal mining region of southern Poland. The authors compare the use of grid nudging and model reinitialization to improve the representation of the near-surface temperature, humidity, winds, and PBL height, and assess the implications for simulating GHGs. While somewhat similar studies have been conducted previously comparing nudging and reinitialization for simulating regional meteorology and climate, none to my knowledge have been at such high spatial resolution, nor have they focused on pollutant transport. Additionally, the linkage between soil moisture drift and PBLH errors is novel. The manuscript is well constructed and clearly written. I recommend the paper be accepted for publication after the minor issue noted below is clarified or corrected.

Lines 271-274 say that flights suitable for model-data comparisons are denoted with asterisks in Fig. 8. However, the caption to Fig. 8 says that asterisks indicate "flights that crossed so close to nearby point sources that we cannot represent them well." It appears that the authors at some point changed whether asterisks denoted "good" vs "bad" flights for comparison against the model.

AC [response]:

We would like to thank the referee for taking the time to read through our manuscript, and for the extremely positive feedback.

The sentence: "This sub-selection of flights is indicated with the asterisks in Fig. 8", which was mistakenly placed after the description of the "good" flights from Line 274. This has now been moved to Line 271, directly after the description of the flights deemed inappropriate for comparison against the model. Furthermore, in response to a comment from Reviewer 1, we clarified in the text which flights were marked with a single or double asterisk, consistent with the caption of Fig. 8.

We also took the opportunity to fix a few typos we noticed in the main text.

*Note that the line numbers here refer to the lines in the preprint version reviewed by the referees.