General comments:

The manuscript "Evaluation of HNO3, SO2, and NH3 in the Surface Tiled Aerosol and Gaseous Exchange (STAGE) option in the Community Multiscale Air Quality Model version 5.3.2 against field-scale, in situ and satellite observations" has been submitted to the journal GMD. The research emphasizes the uncertainty in the deposition mechanism that developed based on the resistance framework for estimating NH3 flux, and the model improvement using additional micrometeorological fluxes. In general, the complex deposition component makes the approach vital for understanding model performance and, further, for improving it. However, the entire research contains two major issues. (1) The main objective seems to modify the commonly used resistance model based on the previous deposition approach. However, the reason for doing this is not clearly explained. In the Introduction, the author mentioned the emission and deposition are treated differently in the regional model. This is understandable because the sources of emissions, including anthropogenic and natural, differ. Moreover, the deposition process, which depends on land surface, particle size, and meteorological conditions, is highly variable and uncertain. The present manuscript primarily evaluates the NH3 flux by comparing micrometeorological fluxes with CMAQv5.3 tabular, which is not relevant to the literature review. Both emission flux and deposition flux need to be analyzed to address the uncertainty mentioned. Or else, simply emphasizing the limitation of CMAQ STAGE and the importance of using micrometeorological flux measurement for STAGE improvement. (2) The entire manuscript is not well written and requires proofreading. For instance, "…CMAQv5.3.2, table 2…Table 3…" in Line 304-306 is confusing.

Specific comment:

Line 18: What is the importance of this methodology? Why is micrometeorological flux measurement significant for the model evaluation and improvement? What is the main limitation of STAGE? The research question and motivation remain unclear.

Line 81-83: STAGE in CMAQv5.3 has already been publicly released. Is the present research proposing a new parameterization (e.g., new STAGE)?

Line 237: What do you mean "would be returned"?

Line 291: Figure 1 or Figure 2?

Line 295: Higher error than which site? Please revise the sentence. How can low LAI and minimal stomatal resistance affect model performance?

Line 295-298: Please revise the whole sentence!

Line 298: This seems to be a statistical error? Please use another statistical index that would exclude the effect of the outlier.

Line 307: How did you define "most sensitive"? Such a description is subjective.

Line 309: What do "NH_3 observed Γ_{ll},$\Gamma_{st}\Gamma_{dew}$" in Figure 3 stand for in general?
Line 325: In Figure 3, STAGE overestimates during 7-13h, and underestimates during 14-23h. This is an interesting contrast and is expected for detail explanation. Is there any possibility that NH3 flux is related to daytime meteorological factors, such as intense solar radiation?
Line 326: How well is the model performing in capturing SO2, HNO3, and NH3 after the measured soil and canopy parameters are used? Please include the statistics before and after the parameter changes.
Line 328-329: What do you mean by CMAQ tabular data? Are you referring to the default setup? How poor is the original STAGE? Pls explain with the bias or correlation index.
Line 409-410: Are you referring to Figure 4?

Technical comment:
Line 81: Two fullstop.