The authors' detailed responses are appreciated, and substantial revisions have been made to address the concerns raised. An explanation for using Cl_{total} as a proxy for the chlorine involved in heterogeneous uptake of NO_2 has been provided, together with additional random forest (RF) analyses. kNO_2 calculation has been clarified, and a sensitivity analysis using different HONO emission factors has been conducted to evaluate their influence on kNO_2 results. For the box model, the scenario setup has been clarified, the HONO deposition velocity has been adjusted, and different γN_2O_5 parameterization schemes have been evaluated. The language throughout the manuscript has also been revised to be more accurate. These revisions have improved the quality of this manuscript. However, a few points regarding the major concerns raised in the first round, detailed below, still need further clarification or discussion.

Re: Major Concern 1 (The relationship between Cl_{total} and kNO_2)

The authors clarified the chemical relationship between gaseous HCl and kNO_2 (lines 166-173). However, regardless of whether gaseous HCl is a direct product of NO_2 hydrolysis or a secondary consequence of the uptake process via acid displacement, it remains a downstream product of the heterogeneous NO_2 uptake process and thus has an inherent correlation with the kNO_2 predicted by the RF model. To put it simply, enhanced heterogeneous NO_2 uptake would result in higher gaseous HCl, but the conclusion of this manuscript is that chlorine promotes the heterogeneous NO_2 uptake. The causal conclusion is not supported by the results.

Additional RF analyses separating particulate Cl^- and gaseous HCl were conducted, and the performance of the RF model and factor importance were evaluated (lines 308-318, Figs. S10-11). The authors found that the factor importance for both particulate Cl^- and gaseous HCl declined when analyzed separately, with RH and SA rising to the top two ranks (Fig. S11). This suggests chlorine might not be an independent causal driver of kNO_2, and that RH, SA, and chlorine may share a common upstream driver, such as the strength of the sea-land breeze circulation, which brings moist air and chlorine-enriched sea-salt aerosols. It is also noted that the overall model r^2 remains largely unchanged (0.89-0.91) across the original RF model and two additional RF analyses, which suggests that RH and SA already capture much of the predictive signal attributed to chlorine in the RF model. This implies that the attribution of high importance to chlorine cannot be taken as independent evidence for its mechanistic role. Calculations of the variance inflation factor or SHAP values for chlorine-related variables, RH and SA, are suggested.

Re: Major Concern 3 (The multiphase chemical box model)

The authors clarified the model setup for each scenario, which is appreciated (lines 190-195). However, it should be noted that even when the observation-derived kNO_2 is applied to the box model, the simulation still substantially overpredicted HONO and nitrate under non-SLB conditions (lines 374-381, Fig. S14). This indicates that the box model itself may have a

systematic bias not related to kNO_2, which in turn raises concern about the reliability of the good observation-model agreement for the SLB days (Fig. 4 a-b). The uncertainties and validation of the box model should be discussed in more detail, rather than being addressed only with the brief statement that "Given uncertainties in BLH, deposition, dilution and other loss processes, this bias cannot be attributed solely to kNO_2" (lines 378-379).