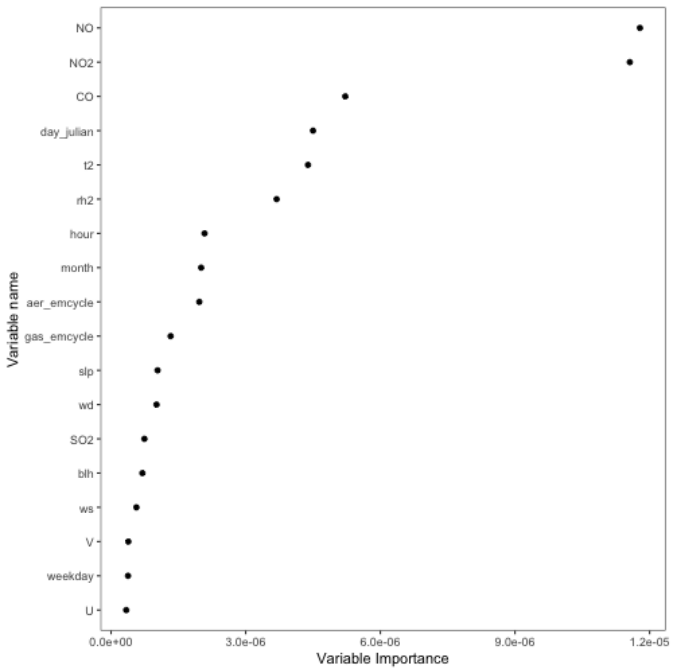
Answer Referee #2

General comments to both referees:
Most of the suggestions received have been adopted. From this, major changes have been made on the study, comprising: (1) the inclusion of Gini importance plots; (2) a modification of the set of predictive variables, adding the boundary layer height and the total cloud cover and (3) the normalization of the meteorological variables. On this basis, we build a new model to decouple the effect of the meteorology for the analysis of the relative changes during COVID-19 period. Although these suggestions led to an overall better implementation of the Random Forest model and a better subsequent analysis, the conclusions remain almost unchanged. Nevertheless, with the new estimated values for the relative changes, we will include substantive modifications in section 3.1.

The manuscript is generally well written and clearly presented. However, its research outcome (i.e the impact of meteorology and regional sources on air quality in Buenos Aires, Argentina) is not new. It should investigate the interactions between input variables to understand more about the Random forest model. I do recommend publishing this work if the authors can solve my major concerns as below:	
Major concerns: 1. Selection of explanatory variables: 1.1. Table 3, line 200-205: Air quality strongly depends upon boundary layer height and long-range transport. Why were these variables not included in this study as input variables in the model? Please refer to a reference by Shi et al. 2021 (Science Advance, Vol 7, Issue 3, “Abrupt but smaller than expected changes in surface air quality attributed to Covid-19 lockdowns”).	Thank you for this recommendation. Following your suggestion we added the boundary layer height as an explanatory variable, and also explored (and finally included) other explanatory variables that were used by Shi et al. 2021, such as total cloud cover. Regarding the intrusion of regional plumes, in general terms, in Buenos Aires local sources prevailed over regional ones, as was also seen in Diaz Resquin et al 2018. Particularly, during the study period (2019 to March 2020) we have been working on the identification of these events undertaking a detailed (day by day) analysis of satellite images and derived products. From this work, which has not yet been published, we found about 10 days with regional plumes impacting at ground level. Supporting that, Otero et al 2020 showed the existence of one of these situations (November 2019 and January 2020) under which regional plumes from Australia fires reached the city, but passed above the boundary layer height. Taking into account all these results, we decided to disregard the long-range transport in this first version of the model. Nevertheless we agree with you that this model could not be representative of other particular periods, where for example the impact of biomass burning events is relevant in terms of the City’s air quality. We will consider this variable for future model improvements.
1.2. Could the author explain why	Several model architectures have been explored

the cho CO, NO as explanatory variables for NO_2? CO and NO were modeled from t2, rh2, U, V and gasoline diurnal patterns, so I guess the author also can model NO_2 based on these variables. Similar questions for explanatory variables for SO_2 and PM_{10}, and O_3.	before choosing the final explanatory variables set. We started using the meteorological and emission patterns variables for all the pollutants analyzed, but found better model results with the configuration presented in the manuscript. The goodness of this selection has been revealed in the Gini Index Figures prepared during this review (see Answer #1 to Reviewer #1). As an example, please take a look of Gini Index for O_3 using all the explanatory variables: 
1.3. In the model of NO_2, did the author investigate interactions between input variables such as NO with t2.	The interactions between input variables have been analyzed estimating the partial dependence between the variables (using the rmweather R package), but also from correlations plots. Part of the analysis performed was included in sections 3.2.1 to 3.2.5. As part of this analysis, we investigated the interactions between NO and t2 in the model of NO2, obtaining the expected behavior (i.e. high temperatures favor the conversion of NO to NO_2). In the revised version of the manuscript we will expand section 3.2.2, including the role of NO and t2 in the model of NO_2.
1.4. In terms of O_3, it strongly depends upon atmospheric temperature. Why does this variable not be included in your model?	We agree with you about the existence of a strong relationship between O_3 and t2. It has also been raised in the partial dependence plots. On the revised version of the model (see Answer#1 to Reviewer#1) t2 has been included as an explanatory variable for O_3 .
2. Testing dataset:	Answer to Q 2.1:

2.1. Figure 2, Line 189: What criteria do authors select testing dataset based on (i,e 2 weeks data before lockdown?) 2.2. In my opinion, the 2-weeks data for testing data sets is too short. Therefore, authors should do a model performance for at least one month before and after the lockdown/partial periods.	We adopted a similar approach applied by Grange et al 2021: (1) all the data measured from Feb-23-2019 to Feb-15-2020 has been randomly split between training (80%) and testing (20%); (2) in addition, to check the adequate model performance under BAU scenario, we used an independent evaluation period two weeks before lockdown. This issue will be clarified, modifying the Figure 2 (see Answer #2 Rev#1) and also the text from lines 187-189. Answer to Q 2.2: As was highlighted in the previous paragraph, the testing data set is 20% of almost 1 year (1430 data points out of 7150 for CNEA and 1742 out of 8710 for PC). In relation with the independent evaluation period, originally we wanted to use 1 month before and 1 month after LD/PLD periods, but: (1) during the last two weeks of February the equipment in CNEA was out of service and (2) since access to the CNEA measuring station was strongly restricted, due to maintenance difficulties the equipment was turned off by May 2020 (line 158-159).
Minor comments: 3.1. Table 4: I think author should include the r value between model and observation rather the r-value for diurnal cycle (r-dc) 3.2. Table 5: In BLD, it should include concentrations of pollutants between observation and model.	Answer to Q 3.1: We included the correlation coefficient of the diurnal cycle because having an adjusted diurnal cycle is a major concern for the region. However, as the analysis of the diurnal cycle has been deeply discussed in the manuscript (Figures 3 and 4), we agree with you that the r value between model and observations will enhance the transparency of the results. Therefore, in the reviewed version of the manuscript, we will modify Table 4, replacing r_{dc} by the r values between model and observations. Answer to Q 3.2: Thank you for this observation; we will modify the manuscript adding a new column in Table 5.
3.3. In discussion: Authors should plot the dependence of concentration of pollutants on meteorological conditions.	As mentioned in Answer 1.3, in the revised version of the manuscript, we will include partial dependence plots in the supplementary material. In addition, in Section 3.1, we will add the analysis of these partial dependencies in depth.