

Interactive comment on “Impacts of the COVID-19 lockdown on air pollution at regional and urban background sites in northern Italy” by Jean-Philippe Putaud et al.

Anonymous Referee #2

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The manuscript provides details of the impacts of COVID-19 lockdown measures on air quality in northern Italy. The results are supported by observations from (1) the European Commission atmospheric observatory of Ispra and (2) regional environmental protection agency (ARPA) air monitoring stations in Milan, and (3) CAMS model simulations. The topic of the manuscript is suitable for the ACP. The manuscript is well written. I suggest the authors including the below-mentioned comments in the revised version.

- (1) Introduction section: A Pi-diagram of sectoral emissions in Italy will be useful.
- (2) CAMS-Ensemble forecast description: This section should be elaborated. Details

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of the accuracy of forecast in terms of statistical significance should also be stated here, although some description is given in section 2.4.1.

(3) A comparison of the percentage change in pollutants in Italy with other countries, during the lockdown should be provided using the literature.

(4) Line 19: Do you mean surface concentrations of atmospheric pollutants (NO₂, PM₁₀, O₃, NO,)

(5) Line 80: tropospheric NO₂ column concentration from Sentinel-5p or surface NO₂? Please clarify.

(6) Is there an influence of dust aerosol during the lockdown period which is seen in PM₁₀ observations?

(7) The reason for using "the same anthropogenic emissions data based on 2011 emission inventories until June 2019, and on 2016 emission inventories afterward" should be stated for clarity purpose. The forecast is highly modulated by the emission inventories.

(8) Figure 3: I suggest plotting standard deviation on observed data. Whether the expected values fall within the range of standard deviation?

(9) To strengthen section 3.1, I suggest providing a plot of the distribution of the VOC/NO_x ratio and related discussions.

(10) Also, discuss if the urban and regional background sites in Italy have experienced ozone enhancement (reduced titration of O₃ by NO) in the past? Is there any specific feature during lock-down?

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