UPEC O₃ pollution over Europe during the COVID-19 lockdown of springtime 2020



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Scientific Objectives

- Quantify the impact of the COV-19 lockdown on ozone pollution over Europe
- Analyze the link with photochemical regimes : NOx-limited & VOC-limited

Which approach ?

→ Synergism of the CHIMERE model, in-situ data, IASI+GOME2 satellite data → Enhanced near-surface sensitivity



COVID-19 lockdown impact on O₃ pollution



Agreement over France, Benelux and Italy. The model underestimates the accumulation of O₃ over the Po Valley and overestimates that over Germany and Poland, and misses the large-scale reduction of ozone

Summary

This "Satellite + In situ + Model" approach shows the following Covid-19 lockdown impacts on ozone:
→O₃ reduction in most NOx-limited regions and at large scale
→O₃ accumulation over Northern Europe due to inhibition of nighttime

titration associated with NO availability

- 2. The new IASI-GOME2 satellite approach shows good agreement with photochemical regimes and with in situ measurements at the surface
- 3. Meteorological conditions in 2020 : particularly sunny conditions also enhanced O_3 over northern Europe. We derive a correction for this effect for observation-assessment of COVID-19 lockdown impact using CHIMERE simulations.
- 4. IASI-GOME2, In-situ vs. CHIMERE : Fair relative agreement on regimes over France/Italy/Spain, but differences in sign over Germany/Poland and the significant background large-scale decrease associated with the lockdown is missing in the model

See more details in Cuesta et al., ACPD paper currently in discussions