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NO_x emissions over Europe from Sentinel 5P and towards Sentinel 4

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Since the launch of the Sentinel 5P satellite, NO₂ observations have become available with a resolution of 3.5x5 km, which allows for the monitoring of NO_x emissions at the scale of city districts and industrial facilities. For Europe, emissions are annually reported for country totals and large industrial facilities and these are made publicly available via the European Environmental Agency . Satellite observations can provide independent and more timely information on NO_x and NH₃ emissions. A new version of the inversion algorithm DECSO (Daily Emissions Constraint by Satellite Observations) has been developed for deriving NO_x and NH₃ emissions for Europe on a daily basis, averaged to monthly mean maps. These are based on observations of TROPOMI (Sentinel 5p) and CrIS. In a newly developed post-processing step anthropogenic NO_x emissions are separated from soil NO_x emissions. These satellite-derived emissions from DECSO have been compared for industrial locations, cities and country totals to the officially reported European emissions and spatial-temporal disaggregated emission inventories like CAMS. In addition, a branch of DECSO is developed to derive hourly NO_x emissions. This new approach has been demonstrated for a high latitude region (around 70 degree North) in summer time, when multiple orbits of Sentinel 5P cover the same location on a single day.