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An overview of ACTRIS observational data in relation to the 2020 lockdown period in Europe

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The identification of the severe COVID-19 virus in December 2019 led the World Health Organization to declare a global pandemic by March 2020. Up till recently with the first available vaccines, the only prevention measures include strict social, travel and working restrictions in a so-called lockdown period that lasted for several weeks (mid-March to the end of April 2020 for most of Europe). This abrupt change in social behaviour is expected to impact local but also regional atmospheric composition, and the environmental impact is highly interesting to study.

The Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS) is a pan-European research infrastructure producing high-quality data and information on short-lived atmospheric constituents and on the processes leading to the variability of these constituents in natural and controlled atmospheres. ACTRIS integrates, harmonizes, and distributes datasets, activities, and services provided by the Central Facilities and National Facilities, located in 22 European countries.

During the lockdown period in spring 2020 most of the ACTRIS observational were operational. The National Facilities performing the ambient measurements are generally regional background sites, with the aim to detect changes on regional level. Within the context of the current COVID-19 outbreak, ACTRIS has been continuously providing access to data on air quality and atmospheric composition. This is of particular interest and importance as it provides unique information measured from the ground to assess the European air quality and atmospheric composition during the lockdown complementing, in a fundamental way, satellite observations and modelling analysis.

ACTRIS released a comprehensive and quality assured set of atmospheric measurement data during the COVID-19 pandemic spring 2020 – January– May 2020. This includes:

- 30 sites with aerosol in situ measurements providing mainly absorption and scattering coefficient, size and/or number distribution. A few sites with high time resolution aerosol chemical composition;
- 12 sites with trace gases in situ data providing VOCs and NO_x measurements; 24 sites with aerosol remote sensing data providing profiles with backscattering and extinction coefficient;
- 11 cloud remote sensing sites providing profile information of 9 various cloud properties.

To facilitate studies, ACTRIS has compiled the data and coined a DOI for the data sets measured during the COVID-19 spring lockdown period, including an intensive aerosol remote sensing campaign in May. This presentation will present the data set and the potential applications and benefits using ACTRIS COVID-19 dataset for studying atmospheric composition changes during COVID-19 lockdown periods.