
SIRTA-ReOBS: the multi-parameter homogenized and value-added database of the SIRTA observatory in Paris region.

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Abstract

The observation of the atmosphere based on in situ measurements, active and passive remote sensing, have evolved enough to be exploited at the inter-annual scale. The existence of long-time series based on observations is essential in order to understand the variability of the atmosphere in a changing climate. Since more than 12 years, many observations have been collected at SIRTA (Instrumental Site for Atmospheric Remote Sensing, www.sirta.fr, 25 km south of Paris) and its surroundings.

All these variables, their associated uncertainties and all metadata are combined in a single netcdf file in the frame of SIRTA-ReOBS database project. An important work is done concerning the quality control of the data. The database now includes about fifty variables hourly averaged from 2003 to now. They can be classified into three categories: (1) classical meteorological variables (pressure, temperature, humidity, wind and rainfall) with information about the regional variability of these variables, (2) the resulting variables from advanced measurement systems (radiative fluxes, heat fluxes, lidar profiles, soil temperature and moisture,...), and (3) geophysical parameters derived from post-processing algorithms (cloud liquid water, aerosol optical depth, integrated water vapor content, boundary layer height, cloud cover, cloud radiative effect ...).

SIRTA-ReOBS is a useful tool to answer questions about atmospheric variability in the Paris region on decadal scale since: (i) the oldest observations are from 2003, thus the monthly, annual and multi-annual variability is well captured; (ii) the hourly time resolution of all variables allows daily cycle analyses; (iii) the multi-parameter approach allows tracing back to the scale of the process.

When analysing SIRTA-ReOBS database, a particular attention is necessary concerning the missing data, especially when we use multi-parameter. Actually, the native temporal sampling is not homogeneous from one variable to another; also, some observations are not continuous for different reasons (necessity of manual operation, only possible under fair weather...). This sets a representativeness challenge when performing variability and trend analyses.

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