Automatic processing of essential climate variables (ECVs) recorded at atmospheric observatories in the framework of NextDATA Project

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The Project of Interest NextDATA (2012-2018, http://www.nextdataproject.it/?q=en), funded by the Italian Ministry for Education, University and Researches, favors the integration of an observational network in Italy based on climate observatories located in mountain, background and rural regions, for the monitoring of atmosphere chemistry and specific essential climate variables (ECVs).

The integration activities pass through the adoption of common procedures for the automatic elaboration of the observed ECVs (trace gases, aerosol properties, meteorological parameters). To this aim, we are implementing a system for centralized and automatic data processing able to support station manager and measurement operators towards a more efficient adoption of QA/QC procedures. Besides boosting the data creation process and favoring a timely data submission, the adoption of standardized validation procedures will also assure a more objective flagging of data as well as the possibility to trace back the actions related to the data validation (i.e. data revisions will be easier).

Data file from stations are transferred daily to the NextDATA server. These files are automatically processed for harmonization of format, data flagging and data aggregation (averaging), according to guidelines provided by GAW/WMO.

Basically, the raw data (typically collected with a 1-min frequency) produced by each single instrument (often recorded with acquisition system not standardized among the different stations), will be elaborated by using an automatic routine based on R codes. Such procedures produce daily, monthly, seasonal and annual data products useful to support the quality control of the data. The automatic processing includes diagnostic/instrumental checks, plausibility checks, variability check, as well as comparison among parallel/simultaneous observations.

We will provide a description of this ECV automatic processing system and related products.