

An automated data quality control procedure applied to a mesoscale meteorological network

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The mesoscale meteorological networks are composed by hundreds of stations providing continuous measurements of several meteorological variables. The large amount of observations collected at the data acquisition center must be checked using automatic Data Quality Control (DQC) tests. An automated DQC procedure describes the application of each individual test and the related decision making algorithms. The goal of a DQC procedure is to supply an efficient and powerful tool to the meteorological analyst.

This work presents an automated DQC procedure and its application to the mesoscale meteorological network of the Lombardia's public weather service (ARPA). In particular, the DQC procedure is applied to hourly average observations of: temperature, relative humidity, wind velocity and direction, global solar radiation, net radiation and hourly cumulated precipitation.

The main idea of the DQC procedure is that each observation undergoes simultaneously many different tests and only once obtained all the results a decision about the observation quality is taken. The implemented tests are variable-dependent but can be classified as: plausible values checks, temporal and spatial consistency checks. Finally, a close inspection of the DQC procedure behavior can also be useful to individuate critical parameters that can be used for the network performance monitoring.

The application of the DQC procedure to some case-studies is reported in order to show the characteristics of the overall procedure. The procedure is still under development, nevertheless the first results respect to its integration in the DQC operative activities are very encouraging.