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Virtual

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Abstract:
At the European Centre for Medium-Range Weather Forecasts (ECMWF), reanalysis is a key contribution to the Copernicus Climate Change Service (C3S) that is implemented at ECMWF on behalf of the European Commission.

The most recent ECMWF global atmospheric reanalysis, ERA5, provides hourly estimates of the global atmosphere, land surface and ocean waves from 1979 at a horizontal resolution of 31km.

Daily updates are provided with a latency of 5 days, while an extension back to 1950 is to be made available in the summer of 2020.

ERA5 uses a recent version of the ECMWF Numerical Weather Prediction forecast model and data assimilation system to assimilate both in-situ and satellite observations (about 96 billion for the period 1979 - 2019), many of which stem from reprocessed data records.

The assimilation method includes a variational method for estimating observation biases that respects the heterogeneity of the observing system.

Information on uncertainties in the state estimates are provided by a 10-member ensemble of data assimilations (EDA) at half the horizontal resolution.

This presentation provides a concise overview of the ERA5 data assimilation system.

A basic evaluation of characteristics and performance is presented, which includes an inter-comparison with other reanalysis products, such as its predecessor ERA-Interim and major reanalyses produced elsewhere.

Attention is given to the importance of the specification of the background error covariance matrix that determines the weight given to the model's first guess in the assimilation.

In addition, a special focus will be on the back extension from 1950 to 1978, where the absence of satellite data prior to 1972 presents a greater challenge to the data assimilation system.