



## **Representation of XX century midlatitude atmospheric variability in ERA-CLIM simulations**

Alessandro Dell'Aquila (1), Susanna Corti (2), Tim Palmer (3), Sandro Calmanti (1), Antje Weisheimer (3,4), Hans Hersbach (4), Carole Peubey (4), and Adrian Simmons (4)

(1) ENEA, UTMEA-CLIM, UTMEA-CLIM, Rome, Italy (alessandro.dellaquila@enea.it), (2) ISAC-CNR, (3) University of Oxford, (4) ECMWF

We analyse the representation of midlatitude winter atmospheric variability as depicted in XX century-long simulations. We analyse the recent atmospheric integrations produced in the framework of ERA-CLIM project in terms of their capability in reproducing midlatitude planetary waves variability as well as baroclinic activity compared against several reanalysis products.

The simulations of ERA-CLIM project (the ERA-20C reanalysis product together with ERA-20CM atmospheric model integrations) could be a quite appealing source of information to catch signals of long term changes.

We apply process oriented metrics and ad hoc indexes to validate the ERA-CLIM simulations and, on the same time, to evaluate signals of multi-decadal variability for planetary and baroclinic waves.

When observational fields are assimilated (even if only the surface ones, as in the case of ERA-20C reanalysis), the representation of atmospheric variability for the last decades of XX century is in a fair close agreement with other reanalysis products (i.e. NCEP, ERA-Interim reanalysis). However, in the first part of the century (up to 40s') the planetary and baroclinic waves exhibit a quite low activity in the reanalysis. This behaviour cannot be found in the ERA-20CM atmospheric integrations that show, on the other hand, a huge variability, in term of representation of large scale atmospheric waves, between different ensemble members.