A climate model configuration of the ECMWF Integrated Forecast System

Chris Roberts (1,2), Retish Senan (1), and Franco Molteni (1)

(1) European Centre for Medium-Range Weather Forecasts, Shinfield Park, Reading, RG2 9AX, United Kingdom, (2) Met Office, Fitzroy Road, Exeter, EX1 3PB, United Kingdom

The European Centre for Medium-Range Weather Forecasts (ECMWF) uses a global general circulation model known as the Integrated Forecast System (IFS) to produce probabilistic ensemble forecasts at lead times of several days to one year ahead. Since November 2016, the operational version of the IFS used to make medium-range/monthly ensemble forecasts has included dynamic representations of the atmosphere, ocean, sea-ice, and ocean waves. Scientific development of the IFS is focussed on the improved representation of processes that are important for predictability on "fast" operational time scales. In order to identify errors associated with "slow" processes it is necessary to run longer climate integrations. Such experiments can provide complementary information to that available from short-range forecasts and may provide additional constraints on the representation of physical processes that are important in forecast mode.

Here, we present results from a climate model configuration of the IFS developed under the auspices of the Horizon 2020 PRIMAVERA project. This configuration is built upon IFS cycle 43R1 and follows the protocols defined by the High Resolution Model Intercomparison Project (HighResMIP) and phase 6 of the Coupled Model Intercomparison Project 6 (CMIP6). We present results from multi-decadal coupled and atmosphere-only experiments and provide an initial assessment of the the impact of resolution and coupling in climate integrations that are traceable to the current ECMWF weather forecast model.