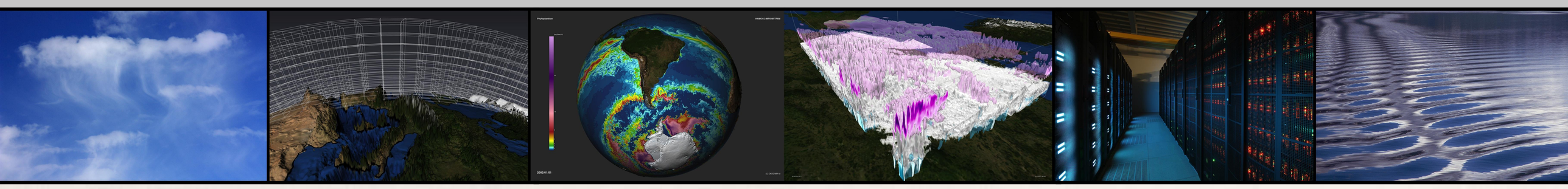
esiwace
CENTRE OF EXCELLENCE IN SIMULATION OF WEATHER AND CLIMATE IN EUROPE

Bull atos technologies

netherlands eScience center

DKRZ DEUTSCHES KLIMARECHENZENTRUM



OVERVIEW

Funding period: Phase 1: 1 Sep 2015 – 31 Aug 2019
Phase 2: 1 Jan 2019 – 31 Dec 2022
Coordination: DKRZ (Joachim Biercamp), ECMWF (Peter Bauer)
Consortium: 20 partners from 9 countries (phase 2)
Call reference: European research infrastructures, INFRAEDI-02-2018

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esiwace CENTRE OF EXCELLENCE IN SIMULATION OF WEATHER AND CLIMATE IN EUROPE

Funded from European Union; Horizon 2020;
Research agreement No 823988
Duration Jan. 2019 – Dec. 2022
Funding: ca 8 Mio €

New Partners: eScience center · MeteoSwiss · ETH zürich · MANCHESTER 1824 The University of Manchester · DDN STORAGE · MERCATOR OCEAN INTERNATIONAL

The **Centre of Excellence in Simulation of Weather and Climate in Europe (ESiWACE)** will push the global high-resolution demonstrators towards production-ready simulations on European **pre-exascale and future exascale systems**. ESiWACE2 further focuses on exploring and exploiting suitable innovative technologies such as Design Specific Languages, on the development of **processing tools** for more efficient I/O and visualisation and on providing enhanced **services, training and benchmarks** for the community.

ESiWACE2 offers and supports various training programmes on **pre-exascale HPC** software engineering, methods and tools for engineers and scientists in the domain of weather and climate. These trainings constitute a transfer of general knowledge from **ESiWACE experts** to the community.

Poster Focus: HPC user-services

Within the ESiWACE2 project, **open HPC services to the Earth system modelling community in Europe are provided.**

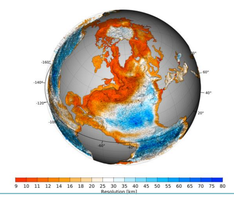
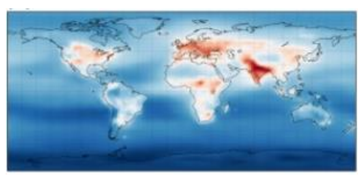
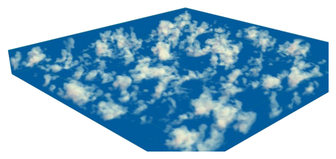
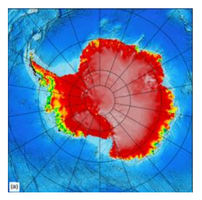
The goal of these services is to create **collaborations that provide guidance, engineering, and advice to support exascale preparations for weather and climate models**. It is the aim to **improve model efficiency** and to enable to port models to existing and upcoming European tier0 systems.

All groups developing and maintaining weather and climate codes - not only the ESiWACE2 partners - can apply. Proposals for such collaboration projects will be peer-reviewed and when found eligible will be granted in-kind support by one of the partners involved.

Three types of services are proposed:

Service 1: Model portability and refactoring **Service 2: Coupling, input, output and workflows** **Service 3: Weather and climate benchmarking**

Focus on Service 1: Model portability and refactoring – Granted projects for 2020

FESOM2 (AWI)	EMAC (The Cyprus Institute)	DALES (CWI, TU Delft)	OBLIMAP 2 (KNMI)
Global sea-ice and ocean circulation model	ECHAM/MESSy Atmospheric Chemistry (EMAC)	Dutch Atmospheric Large Eddy Simulation	Fast climate model–ice sheet model coupler
			
• Profile FESOM2 with GPUs in mind, and port the best suited numerical kernels to GPUs • Get a fresh view on FESOM2 optimization in general	• Improve performance and memory of current CUDA version of the code • Extend its capability to be able to handle an order of magnitude more complex chemistry	• Improve overall performance • Focus on thermodynamics code • Investigate use of single precision	• Resolve the memory bottleneck in the code with MPI shared memory • Implementing parallel netcdf IO • Scale performance to multiple nodes

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