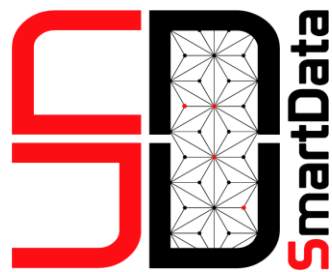




Politecnico
di Torino

SmartData@PoliTO



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SmartTalk: Covivio

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High-resolution climate modeling: State of the art, challenges and open issues

ABSTRACT

Numerical global climate modelling with Earth-system models is currently one of the main tools available for studying processes and feedbacks at work in the climate system, attribution of climate change, projection of future climate change scenarios and the development and planning of mitigation and adaptation measures.

These models have seen in the past decades an extraordinary evolution in terms of the number of components of the climate system represented and of numerical resolution. In addition to a growing need for HPC resources, this progress has been accompanied by a constant growth of the data produced, posing significant challenges in data analysis, distribution, discovery and storage and requiring the development of common community data standards.

Despite this progress, there is still a significant gap in scales between the data provided by state-of-the-art Earth System models, which have been mainly developed for the purpose of scientific enquiry, and the scales needed for many applications for climate impact studies at the local scale, leading to the development of different dynamical and statistical downscaling approaches. In parallel, climate impact studies require a quantification of uncertainty produced at all steps in such a modelling chain, requiring large ensembles of model simulations.

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