Atmospheric blocking under global warming - sources of uncertainty in climate predictions and projections.

Fact Sheet

Project Information

atm blocking

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10.3030/101110631

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Marie Skłodowska-Curie Actions (MSCA)

Total cost
€ 0,00

EU contribution
€ 226 751,04

Start date
1 September 2023

End date
31 August 2025

Coordinated by
UNIVERSITETET I BERGEN
Norway

Objective

Cold spells, heatwaves and droughts have severe socio-economic impacts and are related to a peculiar phenomenon known as ‘atmospheric blocking’. Accurate and timely prediction of blocking frequency and strength is therefore of enormous importance. However, despite decades of research, climate models still exhibit substantial errors in blocking, leading to large uncertainties in seasonal-to-decadal predictions and future projections of blocking trends. At the root of this is the lack of a fundamental theory for blocking and an appropriate metric to identify blocks. A recent theoretical breakthrough offers an exciting path forward by drawing an analogy between blocking in the atmosphere to traffic jams on a highway. The traffic jam – blocking theory, which is based on the conservation properties of large-amplitude
nonlinear waves, has led to a conceptual simplification of why blocks occur. Leveraging the promise shown by this new theory, ATM BLOCKING will provide the first-ever assessment of the key dynamical drivers of blocking errors and trends in the state-of-the-art global climate models. The success of ATM BLOCKING will offer a new theoretical basis for evaluating the performance of climate models in simulating blocks, with an unprecedented ability to pinpoint the responsible atmospheric processes across timescales. Down the road, these results will help policy makers and stakeholders to prepare for risks associated with climate change and weather extremes. The project proposes to address the problem using a combination of theory, numerical modeling and statistical analysis at University of Bergen, Norway in close collaboration with the Bjerknes Centre for Climate Research under the supervision of leading experts in climate dynamics, climate modeling and weather extremes. In addition, the researcher’s own expertise in the theory of blocking will ensure the success of the project while facilitating two-way knowledge transfer between the researcher and the host.

Fields of science

classical mechanics, classical thermodynamics, quantum mechanics, statistical mechanics, astrophysics, particle physics, general relativity, cosmology

Keywords

Jet stream, storm track, extreme event, atmosphere blocking

Programme(s)

HORIZON.1.2 - Marie Skłodowska-Curie Actions (MSCA) MAIN PROGRAMME

Topic(s)

HORIZON-MSCA-2022-PF-01-01 - MSCA Postdoctoral Fellowships 2022

Call for proposal

HORIZON-MSCA-2022-PF-01

See other projects for this call
Funding Scheme

HORIZON-TMA-MSCA-PF-EF - HORIZON TMA MSCA Postdoctoral Fellowships - European Fellowships

Coordinator

UNIVERSITETET I BERGEN

Net EU contribution
€ 226 751,04

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Region
Norge > Vestlandet > Vestland

Links
Contact the organisation  Website  Participation in EU R&I programmes  HORIZON collaboration network

Other funding
€ 0,00

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