

# ATMOSPHERIC BLOCKING

DYNAMICS AND PROCESSES



## PROGRAM

### DAY 1 27 September 2021

09:00 - 09:30 UTC Organizers

Welcome and technical introduction

#### 09:30 - 11:00 UTC Session 1: Blocking Lifecycles I (Chair: Philipp Zschenderlein)

09:30 - 10:00 UTC	Yamazaki	Vortex-vortex interactions for the maintenance of blocking: The selective absorption mechanism
10:00 - 10:15 UTC	Yamamoto	A study on maintained vortices accompanied by the westerlies regarding cyclonic-anticyclonic asymmetry
10:15 - 10:30 UTC	Polster	Sensitivity of Blocking Onset to Local Wave Activity
10:30 - 10:45 UTC	Suitters	Blocking events as a result of a dynamical succession of different large-scale configurations
10:45 - 11:00 UTC	Ehstand	Characteristic signatures of Northern Hemisphere blocking events in a Lagrangian flow network representation of the atmospheric circulation

11:00 - 11:30 UTC Discussion time and coffee break

#### 11:30 - 13:00 UTC Session 2: Latent Heating (Chair: Annika Oertel)

11:30 - 12:00 UTC	Pfahl	An introduction to the influence of latent heat release on atmospheric blocking
12:00 - 12:15 UTC	Teubler	PV dynamics of blocked weather regimes in the Atlantic European region
12:15 - 12:30 UTC	Hauser	Two complementary views on potential vorticity dynamics of blocked weather regimes in the Atlantic-European region
12:30 - 12:45 UTC	Zschenderlein	A Lagrangian analysis of upper-tropospheric anticyclones associated with heat waves in Europe
12:45 - 13:00 UTC	Lenggenhager	Atmospheric blocking and heavy precipitation - a two-way interaction

13:00 - 13:45 UTC Discussion time and coffee break

**13:45 - 15:15 UTC Session 3: Blocking Lifecycles II (Chair: Behrooz Keshtgar)**

13:45 - 14:15 UTC	Nakamura	Regional eddy-mean flow interaction and block formation
14:15 - 14:30 UTC	Leicht	Processes that Govern the Structure and Evolution of Persistent North Pacific Wintertime Ridge Regimes
14:30 - 14:45 UTC	Wang	Atmospheric Blocking as an Evolution of Rossby Wave Packets
14:45 - 15:00 UTC	Lojko	The Role of North American Mesoscale Convective Systems in the Onset of the June 2017 European Heatwave: An Analysis of Dynamics and Forecast Skill
15:00 - 15:15 UTC	Hell	Atmospheric zonal flows and blocks from the perspective of Rossby-beta hydraulics

15:15 - 15:45 UTC Discussion time and coffee break

**15:45 - 16:15 UTC Poster Session I: Introduction (2min-Talks)**

**16:15 - 17:30 UTC Poster Session I**

Brunner	The Limits of Blocking Persistence - Introducing an ensemble boosting approach with CESM
Preece	Distinguishing Summer Greenland Blocking Types and their Impact on Greenland Ice Sheet Melt: Long-term trends and association with the North Atlantic Oscillation
Brand	European Blocking Events within the German Climate Forecast System 2.1
Steinfeld	Response of physical processes in atmospheric blocking to climate change
Nunes	Dynamic and radiative effects of stratospheric ozone on atmospheric blocking in southern South America
Riboldi	Space/time spectral analysis of atmospheric blocking
Schiemann	Northern Hemisphere blocking simulation in current climate models: evaluating progress from the Climate Model Intercomparison Project Phase 5 to 6 and sensitivity to resolution
Pettersen	The Critical Role of Euro-Atlantic Blocking in Promoting Snowfall in Central Greenland

Lackmann	Analysis of persistent anomaly trends and future changes in reanalyses and high-resolution time-slice simulations using a flow-dependent index
Faranda	Minimal dynamical systems model of the Northern Hemisphere jet stream via embedding of climate data
Messori	Planetary wave-breaking and blocking as drivers of compound North-American and European weather extremes at multiple timescales
Büeler/Grams	Year-round sub-seasonal forecast skill for Atlantic-European weather regimes
Chan	Heatwave-causing blocking decreases with CMIP6 simulated global warming

## DAY 2                    28 September 2021

09:00 - 09:30 UTC    Social time

### 09:30 - 10:00 UTC Poster Session II: Introduction (2min-Talks)


### 10:00 - 11:15 UTC Poster Session II

Chen	Contributions of Arctic sea-ice loss and East Siberian atmospheric blocking to 2020 record-breaking Meiyu-Baiu rainfall
Kim	Enhanced linkage of Arctic-Eurasian surface air temperature by the strong coupling of blocking and sea ice over the Barents-Kara seas
Richling	Linkage between Arctic Sea Ice Area and Atmospheric Blocking Probability over Europe using Logistic Regression Models
Yamamoto	Oceanic moisture sources contributing to wintertime Euro-Atlantic blocking
Tozer	How well do GCMs simulate the onset and decay of the atmospheric circulation associated with Australian regional climate extremes?
Yessimbet	Investigating the connection between tropospheric blocking and sudden stratospheric warming events using GNSS radio occultation observations

Grams	The role of cloud diabatic processes in the life cycle of Atlantic-European weather regimes
Li	A meridional potential vorticity gradient index for atmospheric blocking
Fuentes-Franco	Exploring the influence of the atmospheric North Pacific Ocean Rossby wave sources on interannual variability of summer precipitation and surface temperature over the Northern Hemisphere
Spensberger	Dynamics of concurrent and sequential Central European and Scandinavian heatwaves
Ma	The role of transient eddies and diabatic heating in the maintenance of European heat waves: a nonlinear quasi-stationary wave perspective
Efe	Impact of Atmospheric Blocking on Spring and Summer Season Drought for South Anatolia Project Region, Turkey

11:15 - 11:30 UTC Coffee break

#### 11:30 - 13:00 UTC Session 4: Review and Blocking Detection (Chair: Mubashshir Ali)

11:30 - 12:00 UTC	Hoskins	A review of some ideas on blocking	
12:00 - 12:15 UTC	Sousa	A new combined detection algorithm for blocking and subtropical ridges	
12:15 - 12:30 UTC	Hanna	Extended North Atlantic Oscillation and Greenland Blocking indices 1806-2020 from new meteorological reanalysis	
12:30 - 12:45 UTC	Liu	Blocking Simulations in GFDL GCMs for CMIP5 and CMIP6	
12:45 - 13:00 UTC	Narinesingh	Atmospheric Blocking and General Circulation in current and future climate scenarios using GFDL models	

13:00 - 14:00 UTC Discussion time and coffee break

## 14:00 - 15:45 UTC Session 5: External Forcing (Chair: Maria Madsen)

14:00 - 14:30 UTC	Henderson	Subseasonal variability of Northern Hemisphere winter blocking: the role of MJO teleconnections and its dependence on ENSO
14:30 - 14:45 UTC	Cheung	Robust Influence of Mid-Latitude Atlantic and Pacific SST Fronts on Euro-Atlantic Blocking
14:45 - 15:00 UTC	Tyrlis/Semmler	Exploring remote and local drivers of blocking activity
15:00 - 15:15 UTC	Quinting	On the role of warm conveyor belts in shaping MJO midlatitude teleconnections in reanalysis and reforecasts
15:15 - 15:30 UTC	Jiménez-Esteve	The impact of large-scale topography and latitude on blocking related to heatwaves in idealized model simulations
15:30 - 15:45 UTC	Booth	Atmospheric blocking in an aquaplanet and the impact of orography

15:15 UTC Discussion time (15') and Gather Town

## DAY 3 29 September 2021

09:00 - 09:30 UTC Social time

### 09:30 - 10:45 UTC Breakout Group Discussions I

#### TOPIC 1

Blocking dynamics

#### TOPIC 2

Role of teleconnections/  
remote drivers

#### TOPIC 3

Representation in weather  
and climate models

#### TOPIC 4

Impacts and extreme  
weather

10:45 - 11:15 UTC Coffee break

**11:15 - 12:45 UTC Session 6: Climate Projections (Chair: Amelie Mayer)**

11:15 - 11:45 UTC	Drouard	Blocking and its response to climate change in the Northern Hemisphere
11:45 - 12:00 UTC	Strommen/ Dorrington	Blocking Regimes in CMIP6: Model Performance and Drivers
12:00 - 12:15 UTC	Tierney	Characteristics and Energetics of Idealized Persistent Geopotential Anomalies in Future Climates
12:15 - 12:30 UTC	Nabizadeh	The 3D Structure of Northern Hemisphere Blocking Events: Climatology, Role of Moisture, and Response to Climate Change
12:30 - 12:45 UTC	Hassanzadeh	Size of the Atmospheric Blocking Events: Scaling Law and Response to Climate Change

12:45 - 13:30 UTC Discussion time and coffee break

**13:30 - 15:00 UTC Session 7: Predictability (Chair: Christopher Polster)**

13:30 - 14:00 UTC	Matsueda	tba
14:00 - 14:15 UTC	Wandel	Representation of warm conveyor belts in ECMWF's IFS sub-seasonal reforecasts and the link to atmospheric blocking over Europe
14:15 - 14:30 UTC	Wernli	An analysis of IFS ensemble spread in blocks and other weather systems
14:30 - 14:45 UTC	Winters	Subseasonal Prediction of the North Pacific Jet Stream and Implications for High-Latitude Blocking
14:45 - 15:00 UTC	Peings	Ural Blocking as a Driver of Early-Winter Stratospheric Warmings

15:00 - 15:30 UTC Discussion time and coffee break

**15:30 - 16:45 UTC Breakout Group Discussions II**

**TOPIC 1**

Blocking  
dynamics

**TOPIC 2**

Role of teleconnections/  
remote drivers

**TOPIC 3**

Representation in weather  
and climate models

**TOPIC 4**

Impacts and extreme  
weather

16:45 - 17:00 UTC Grab a drink/coffee for the last part of the workshop!

**17:00 - 17:45 UTC Reports Breakout-Sessions, Summary/Feedback, Goodbye**