

# ACTIVITY REPORT:

## Dynamics and Variability Activity

### Activity leads:

Daniela Domeisen, ETH Zurich

Alexey Karpechko, Finnish Meteorological Institute

Former leads: Ed Gerber (NYU) + Elisa Manzini (MPI-Hamburg)

### 27<sup>th</sup> SPARC SSG meeting

December 2019

Boulder, CO, USA

- **DynVarMIP – DynVar – SNAP Meeting, Madrid 22-25 October**
  - 94 participants from 17 countries
  - 57 oral presentations, 41 posters
  - Support from U. Complutense Madrid (our host), US NSF, WCRP Grand Challenges, SPARC & IAMAS enabled 20+ ECSs to attend
- **DynVarMIP (part of CMIP6)**
  - diagnostics are becoming available
  - 3 community papers are in preparation

- Several CCMI presentations at the DynVarMIP workshop
- Joint analysis of CMIP6 and CCMI simulations

- DynVarMIP support for the CMIP6: 3 community papers in preparation
- Extreme variability in the stratosphere: Sudden Stratospheric Warmings (SSWs) **Models robustly capture tropospheric impacts of SSWs and project an extended season of active stratosphere-troposphere coupling under CO<sub>2</sub> forcing.**
- Stratospheric overturning (Brewer-Dobson Circulation) response to global warming **Models project robust strengthening of the circulation, increasing the cycling of radiatively important trace gases (ozone, water vapor).**
- Role of the stratospheric vortex in circulation trends **Differences in the response of the polar vortex are coupled to variations in surface trends through Rossby & gravity waves.**

- DynVar Activity plans
  - continuation of DynVarMIP under the leadership of Ed Gerber and Elisa Manzini
  - increased focus on the troposphere and extremes, while remaining a home for the stratosphere dynamics community
  - workshop in 2022: bring together the stratosphere and extremes communities
  - community paper: dynamical contributions to extremes

- Which direction would you like to see SPARC move forward to?
  - Supporting fundamental research and arguing against using poorly understood aspects of model simulations for impact studies
- What are important research questions?
  - What can we say about regional climate change from dynamical perspective?
  - Why do models predict what they predict?
  - Robust vs model-dependent change

- What collaborations should be maintained or started?
  - Regional climate and extremes community
  - Storm tracks community (workshop in 2021)

- your view on the WCRP
  - Strategic Plan (SP; <https://www.wcrp-climate.org/wcrp-sp>)
  - and Implementation Plan (IP; <https://www.wcrp-climate.org/wcrp-ip-overview>) (note: this is a work in progress!)
- how should SPARC's new strategy fit in with those plans?
- What are important issues that need to be addressed in the WCRP IP?



- Any issues requiring the immediate attention of the SPARC SSG
  - Leadership change from Elisa Manzini and Ed Gerber to Daniela Domeisen and Alexey Karpechko