



# ***Contributions to WMAC: SPARC and Polar Climate Predictability***

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# CCMVal

(Lead: Veronika Eyring, DLR)



- Concerns stratosphere-resolving AGCMs with interactive ozone chemistry (i.e. chemistry-climate models)
  - Models are beginning to include tropospheric chemistry and to be coupled to ocean models
- Much experience in process-oriented model evaluation and analysis of multi-model projections
- Large community involved in analysis (SPARC CCMVal Report, 2010, and associated papers)
- Strong liaison with measurement community
- Will evolve into a joint IGAC-SPARC “Chemistry-climate modelling initiative” as a result of 2012 Davos workshop
- Next workshop in Boulder (May 2013)



# DynVar

(Lead: Elisa Manzini, MPI-Hamburg)



- Concerns stratosphere-troposphere dynamical variability in stratosphere-resolving models
  - Complements CCMVal
- Many problems to address: systematic errors, low-frequency variability, mechanisms of dynamical coupling
- Had originally focused on use of hierarchies of models; not much progress there, so is currently focused on two CMIP5 synthesis papers (high-top models)
- Large (and young) community exists (e.g. Boulder workshop November 2010)
- Next workshop in Reading (April 2013)



# Data Assimilation Working Group

(Lead: David Jackson, UKMO)



- Meets annually, mainly just as a vehicle for interaction between the different groups
  - Next meeting (summer 2013) likely in Japan
- Has focused on creating linkages with process scientists (usually, a minority of attendees are data assimilators)
- The only past collective activity was the SPARC-IPY archive of various analysis products (not much used)
- Two separate activities recently spawned (S-RIP, SNAP)
- At this point, stratospheric data assimilation is now “mainstream” so the goals of the group are evolving
- A long-standing issue remains assessing unresolved gravity-wave drag



## **SNAP (joint with WGNE)**

(Lead: Andrew Charlton-Perez, U Reading)



- “Stratospheric Network on Assessment of Predictability”
- Coordination funded by NERC, based at Univ of Reading
- Goal: assess added value of stratosphere for NWP, for both initial state estimation and dynamical evolution
- Plan is to:
  - Define intercomparison experiment through an initial workshop (April 2013 in Reading, joint with DynVar)
  - Facilitate a crowd-sourced analysis of the results
  - Discuss the results in an open workshop
  - Produce a peer-reviewed synthesis SPARC Report based on the results of the intercomparison



# SOLARIS

(Lead: Katja Matthes, IFM-GEOMAR, Kiel)



- Focus on climate effects of solar variability, mainly 11-year solar cycle
- Small but committed working group meets regularly
- Integrated with CCMVal; provides solar input to CMIP
- Current focus is on robustness, e.g. addressing issues of potential aliasing in the (short) observational record
- Is joining with HEPPA (High Energy Particle Precipitation in the Atmosphere), led by Bernd Funke (IAA, Granada), whose focus is on shorter time-scale solar variations
  - Will bring stronger link to measurement community
- Next workshop in Boulder (October 2012)



# GeoMIP

(Lead: Alan Robock, Rutgers)



- Not a SPARC activity per se, but has liaison with SPARC on stratospheric aspects (Alan reports at SSG meetings)
- Several CCMVal groups are contributing to GeoMIP
- May spawn related activities in the emerging SPARC SSiRC activity (Stratospheric Sulfur and its Role in Climate), led by Markus Rex (AWI Potsdam)



# WCRP Polar Climate Predictability Initiative



Planning meeting in Toronto (April 2012) defined several imperatives of relevance to WMAC:

- Improve the climate models that are used for simulating past and future polar climate
  - Improve process parameterizations
- Assess model performance and inform new model development
  - Assess how much confidence we can place in models
- Define proper use of models to answer frontier questions
- Improve prediction





as well as several relevant implementation mechanisms:

- Synthesis workshop focused on Antarctic climate and its change, as represented in data records, reanalyses and CMIP models
- Workshop to construct metrics that can be used to assess models in polar regions
- Workshop to synthesize the polar performance in CMIP5 analysis
- Workshop to assess, understand, and improve predictability experiments (involve WGSIP and YOPP)
- Special session or paper collection to debate Arctic-midlatitude connectivity (linkage with IASC and WWRP)