SPARC Data Assimilation Working Group (DAWG) and NWP links

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SPARC activities

- SPARC activities are often focused on “bite-sized” efforts that produce highly regarded publications. E.g. SPARC reports:

1. SPARC-IOC Assessment of Trends in the Vertical Distribution of Ozone (1998).
2. SPARC Assessment of Upper Tropospheric and Stratospheric Water Vapour, WCCRP N° 113, WMO/TD-N° 1043 (December 2000)
3. SPARC Intercomparison of Middle Atmosphere Climatologies, WCCRP N° 116, WMO/TD-N° 1142 (December 2002)
4. Assessment of Stratospheric Aerosol Properties (ASAP) WCRP-124, WMO/TD- No. 1295 (February 2006)
5. SPARC CCMVal (2010), SPARC Report on the Evaluation of Chemistry-Climate Models, V. Eyring, T. G. Shepherd, D.W. Waugh (Eds.), SPARC Report No. 5, WCRP-132, WMO/TD-No. 1526.

Timed to feed into WMO ozone assessment and IPCC reports

SPARC review articles

- The GCM-reality intercomparison project for SPARC (GRIPS): scientific issues and initial results, S. Pawson, K. Kodera, K. Hamilton *et al.*, B.A.M.S., 81 (4), April 2000.
- Stratospheric temperature trends: observations and model simulations, V. Ramaswamy, M.L. Chanin, J. Angell, *et al*., Rev. Geophys., 39, 2, pp71-122, 2001.
- The Quasi-Biennial Oscillation, M.Baldwin, L.J. Gray, T.J. Dunkerton et al., Rev. Geophys., 39, 2, pp 179-229, 2001
- Report on the SPARC tropical tropopause workshop, Bad Tölz, Germany,17-21 April 2001, Peter Haynes and Ted Shepherd
- Baldwin, M.P., Thompson D.W., Shuckburgh, E., Norton, W., Gillett, N.,Weather from the Stratosphere, Science 301, 317-319, 2003.
- Baldwin, M.P., Stephenson, D.B., Thompson D.W., Dunkerton, T.J., Charlton, A.J., O'Neill, A., Stratospheric memory and skill of extended-range weather forecasts, Science, 301, 636-640, 2003.
- A. Ravishankara, S. Liu, U. Platt, T. Bates, I, Bey, K. Carslaw, M. Chipperfield, A. Douglass, D. Fahey, G. Feingold, S. Fuzzi, A. Gettleman, C. Granier, D. Hauglustine, C. Mari, A. O'Neill, D. Parrish, P. Quinn, W. Randel, K. Rosenlof, T. Shepherd, and P. Simon, Climate Chemistry Interactions, Report from the joint SPARC/IGAC workshop, 3 - 5 April 2003 Giens, France

SPARC Data Assimilation Working Group: goals

Created in 2002 to coordinate and promote data assimilation work relevant to SPARC

- Collect information on stratospheric data sets on meteorology and chemistry (quality, availability, software…).
- Process-focused quality assessments.
- Collect and document information in data assimilation systems.
- Liaise with space and other agencies (e.g. GCOS) on SPARC data needs.
- Workshops, newsletter or review articles, intercomparisons

GOALS of Improving SPARC / NWP Links Discussion

- Stratospheric DA increasingly relevant to NWP

- SPARC wants SPARC DAWG to be a link to the NWP community. Make more of this than currently?

- Proposed joint WGNE-SPARC initiative on examining the impact of the stratosphere on the troposphere in operational NWP. Starting point?

WGNE and SPARC: new link

- Attended WGNE meeting (Tokyo, 18-22 October 2010) as new SPARC ex-officio representative
- Raised profile of SPARC within WGNE
- Article on CONCORDIASI campaign for January 2011 SPARC newsletter. More detailed article to come for June 2011 issue. Observations over Antarctica during campaign to be available to SPARC community.
- New additions to SPARC and SPARC-DA mailing lists
- WGNE recommendations for WGNE:
  1. Improve links: SPARC-DA and THORPEX-DA groups
  2. Connect SPARC TTL work with WGNE convection group
  3. Something to be done in non-orographic GWD area? E.g. Would Transpose-AMIP simulations be useful?

SPARC – NWP link

- SPARC-WGNE link offers a real opportunity for better linkage between SPARC-DAWG and NWP centres. Could be done via:
  - 1) Can we document stratospheric modelling and assimilation work at NWP centres? Goal: SPARC or WGNE review document . Focus on aspects related to medium-range (up to 10 or 14 days) forecasting.
  - 2) Can we form a coordinated effort to really isolate the impact of the stratosphere on tropospheric medium-range weather forecasts? (WGSIP is doing just this for seasonal prediction). Maybe this type of question cannot be resolutely answered by a single centre.
  - 3) Can the NWP products serve as a resource to address questions of gravity wave depiction or parameterization?
  - 4) Better diagnostics for the stratosphere? (see separate discussion)

Suggestions from Manuel Pulido

- One proposal could be an intercomparison of resolved and parameterized GWD in some particular events (e.g. vortex breaking in spring) using different analysis systems. Would this be useful?

- Are NWP centers are going to use operationally 'new' measurements in the upper stratosphere and mesosphere (SABER MLS etc). If so, a diagnostic of GWD and GWD effects on the circulation of the models could be quite useful. In the sense that standard measurements do not constrain GWD peak because they do not reach the mesosphere.

End