SPARC
Activity Report 2018

I. Achievements and Plans

** What has your activity achieved over the past year? Have you completed any major deliverables e.g. reports or reviews or reached any major milestones? (This material will be incorporated into the Annual Report).*

Activity: Polar Stratospheric Cloud initiative (PSCi)

During the past year, the PSCi team has completed a series of important journal papers that will feed into the upcoming review paper. These include two comprehensive PSC climatology papers based on the long-term MIPAS (Spang et al., 2018) and CALIOP (Pitts et al., 2018) data records. These publications are the foundation of the review paper chapter on the spatial/temporal distribution, composition, and microphysical properties of PSCs. In addition, journal papers describing the MIPAS PSC volume density retrievals (Hoepfner et al., 2018); improved representation of PSCs in the CLaMS model (Tritscher et al., 2018), and comparisons of in situ microphysics and optical remote sensing of PSCs in Antarctica (Snels et al.) are under review. With the completion of these papers, the team is now focused on the compilation of the Review paper itself, with complete drafts of each chapter now nearing completion. A formal proposal for a review of PSCs has recently been submitted to Reviews of Geophysics. We anticipate submitting the review paper early next year.

Höpfner, M., Deshler, T., Pitts, M., Poole, L., Spang, R., Stiller, G., and von Clarmann, T.: The MIPAS/Envisat climatology (2002–2012) of polar stratospheric cloud (PSC) volume density profiles, Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2018-163, in review, 2018.

Pitts, M. C., Poole, L. R., and Gonzalez, R.: Polar stratospheric cloud climatology based on CALIPSO spaceborne lidar measurements from 2006–2017, Atmos. Chem. Phys., 18, 10881-10913, https://doi.org/10.5194/acp-18-10881-2018, 2018.

Snels, M., Scoccione, A., Di Liberto, L., Colao, F., Pitts, M., Poole, L., Deshler, T., Cairo, F., Cagnazzo, C., and Fierli, F.: Comparison of Antarctic polar stratospheric cloud observations by ground-based and spaceborne lidars and relevance for Chemistry Climate Models, Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-589, in review, 2018.

Spang, R., Hoffmann, L., Müller, R., Grooß, J.-U., Tritscher, I., Höpfner, M., Pitts, M., Orr, A., and Riese, M.: A climatology of polar stratospheric cloud composition between 2002 and 2012 based on MIPAS/Envisat observations, Atmos. Chem. Phys., 18, 5089–5113, https://doi.org/10.5194/acp-18-5089-2018, 2018.

Tritscher, I., Grooß, J.-U., Spang, R., Pitts, M. C., Poole, L. R., Müller, R., and Riese, M.: Lagrangian simulation of ice particles and resulting dehydration in the polar winter stratosphere, Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-337, in review, 2018.

** What does your activity plan to do over the coming year? What deliverables (e.g. reports, review papers) do you plan to complete? (This material may also be incorporated into the Annual Report).*

The PSCi team will complete the PSC review paper and submit it to Reviews of Geophysics in early 2019.

II. Resources

** What workshops have you planned for the coming year and what level of WCRP/SPARC funding do you require to support those workshops? For what do you intend to use any allocated funding? (This information will guide the allocation of SPARC travel support over the coming year).*

No WCRP/SPARC funding requirements are anticipated.

** What funding proposals does your activity have in the works? What resource issues is your activity facing? Is there anything that the SSG can do to help? What funding opportunities could SPARC be pursuing? (The information you provide here will guide the discussion at the SPARC SSG meeting).*

The PSCi activity continues to be supported through various funding the NASA CALIPSO/CloudSat Science Team, and the German Research Foundation (DFG). We anticipate sufficient funding will continue to complete the activity.

III. WCRP Communications[†]

** What are the data issues/needs for your activity? (This information will be communicated to the WCRP Data Advisory Council).*

None.

** What are the modelling issues/needs for your activity? (This information will be communicated to the WCRP Modelling Advisory Council).*

None.

IV. SPARC Programmatic Issues

** To which other SPARC or WCRP activities does your activity connect? Should you be thinking about joint workshops? Can the SSG do anything to help foster better connections between your activity and other SPARC/WCRP activities? (This will also guide the discussion at the SPARC SSG meeting).*

There could be a connection with CCMI. The modellers can make use of our reference PSC climatology/dataset to test/validate polar chlorine activation/denitrification processes within their models.

There could also be a connection with the Gravity Wave activity- in terms of how gravity waves impact PSC formation. Dynamical forcing of PSCs will be addressed within the PSC review paper.

** Has your activity contributed in any way to SPARC's capacity development effort? Is there any way the SSG capacity development group can help you to do more?*

We have not been able to identify anyone from countries with developing science programs that can actively participate- we could use help to identify potential participants.

** Is there anything else that the SSG can do to assist your activity in any way? (This will also guide the discussion at the SPARC SSG meeting).*

No- but we will contact the SPARC office if anything comes up.

** Please also take this opportunity to revisit the material published for your activity on the SPARC web page. (Please communicate any required changes to the SPARC Project Office).*

Done.

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† Issues/needs in this context refers especially to those that may require WCRP engagement beyond SPARC.