

# SPARC LOTUS workshop report

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## **DATES:**

13 – 15 March 2017

## **ORGANISERS:**

Sophie Godin-Beekmann (LATMOS, Université Pierre et Marie Curie, Paris, France), Daan Hubert (Royal Belgian Institute for Space Aeronomy, Brussels, Belgium), and Irina Petropavlovskikh (Global Monitoring Division, NOAA, Boulder, Colorado, USA)

## **HOST INSTITUTION:**

LATMOS, Université Pierre et Marie Curie, Paris, France

## **NUMBER OF PARTICIPANTS:** 30

## **SPONSORS:**



## **BACKGROUND:**

LOTUS (Long-term Ozone Trends and Uncertainties in the Stratosphere) is an international research initiative endorsed by SPARC and the International Ozone Commission. LOTUS aims to revisit the methods used to derive long-term vertically-resolved trends of stratospheric ozone and to improve our understanding of the uncertainty budget. This work will contribute significantly to the 2018 WMO/UNEP Ozone Assessment.

## **ACTIVITY WEBSITE:**

[www.sparc-climate.org/activities/ozone-trends](http://www.sparc-climate.org/activities/ozone-trends)

A first LOTUS workshop was organised by the coordinators of the initiative (Daan Hubert, Irina Petropavlovskikh, and Sophie Godin-Beekmann) and hosted by LATMOS at the Université Pierre et Marie Curie in Paris, France, from 13-15 March 2017. Thirty researchers attended this invite-only workshop and participated in a lively informal meeting with a selected number of scheduled oral presentations and ample time for discussions. An overview presentation about the needs for Chapter 3 of the upcoming WMO/UNEP Ozone Assessment by the lead authors supported the scope of the meeting and stressed the timeline of LOTUS. The workshop participants discussed the status of the activities of the two working groups: MIDI (production of observation time series) and ROAST (regression analyses of the time series).

During the MIDI session, we focused on results and plans of the assessment of quality and uncertainties of ozone profile time series made available to the LOTUS project by a number of participating satellite and/or ground-based instruments principal investigators. Several new ozone profile composites are being produced for use in the LOTUS project besides from recent updates and improvements to existing single or merged data records. In addition to improved long-term stability of satellite records in combined datasets, trend analyses can now rely on longer and more consistent measurement records. Several questions were addressed, such as the impact of changing sampling patterns, the impact of instrument drift and biases between instruments, as well as methods to obtain reliable estimates of relevant uncertainty in trend analyses. First results indicate clear improvements in the agreement between the time series of the different datasets, and some historical disagreements are now much better understood.

During the ROAST session we discussed the activities, first results, and plans of the working group focusing on the regression analyses of ozone profile time series. Participants interrogated currently available methods to determine a preferred set-up for regression models, ranging from what proxies to include, the use of a linear versus non-linear model, or whether to incorporate the uncertainty of observations in the regression or not. We agreed on the main options to explore further in the coming months. These sensitivity tests will inform us about the robustness of estimated trends and uncertainties against



**Figure 18:** Participants of the LOTUS workshop held at the Université Pierre et Marie Curie in Paris, France from 13-15 March 2017.

alternative choices in the regression analysis. In addition, first results of a technical test of regression codes developed independently by twelve groups were presented. Consistent results were obtained in general for most regressed parameters, showing that there are no major flaws in any of the participating codes.

The workshop concluded with an interactive session to define the outline of the final LOTUS

report, which will include – besides the results of the activities mentioned above – an identification of remaining open issues.

More detailed information on the LOTUS workshop can be found at: <https://events.oma.be/indico/event/23/overview>.

