

Dear Dr. Cahalan,

This brief report on the status of the Atmospheric Spectroscopy Applications (ASA) Working Group is in response to your e-mail of 27 February.

First a little history: The ASA working group was conceived at the time of the International Radiation Symposium that took place in Perugia in 1984; ASA had its first ad hoc meeting at the Ozone Quadrennial meeting the following week. The six principal topics of ASA are:

- Line shape, Line-coupling, and Continua
- Atmospheric Observations
- Experimental Techniques
- Laboratory Data
- Databases
- Non-local Thermodynamic Equilibrium Processes

Initially, Rudolphe Zander of the Université de Liège, Belgium, representing the IRC, and Prof. Alain Barbe of the University of Reims, France, representing the International Ozone Commission, were co-chairs. Dr. Zander passed the chairmanship of the meeting over to me in 1990, and I have been co-chair with Alain Barbe up to the present.

We have held international ASA workshops every three years (Oxford 1987, Moscow 1990, 2002, Reims 1993, 1996, 1999, 2005, 2008). In addition to the proceedings of these meetings, several peer-reviewed Special Issues have resulted: *Journal of Quantitative Spectroscopy and Radiative Transfer (JQSRT)* volume **52**, number 3-4 (1994); *JQSRT* volume **39**, number 3-5 (1998); *Atmospheric and Oceanic Optics*, volume **16**, number 3 (2003).

The stated goals of ASA are the following:

- 1) To bring together laboratory spectroscopists and field experimentalists (who perform balloon-borne, airborne, ground-based, and satellite measurements).
- 2) To evaluate the spectroscopic requirements in terms of line parameters.
- 3) To make the best possible assessment of the errors in atmospheric data and the associated spectroscopic parameters, geophysical parameters, and experimental uncertainties.
- 4) To evaluate the accuracies and sufficiency of the molecular spectroscopic databases, for example HITRAN, and to make recommendations for their updates.
- 5) To make recommendations in a general sense for future efforts to obtain grants by various sponsors at national and international levels.
- 6) To extend the range of the scientific investigations related to the atmospheric spectroscopic application.
- 7) To include applications to planetary atmospheres.

These meetings have produced much fruitful collaboration, and foster a greater appreciation for standards and intercomparison efforts needed in atmospheric spectroscopy.

The 8<sup>th</sup> ASA meeting took place in Reims, 27-30 August 2008. We note a slight evolution with respect to those of the previous meetings (Oxford 1987, Moscow 1990 et 2002, Reims 1993, 1996, 1999 and 2008). Indeed, there were more laboratory data, in particular with respect to collisional effects and their direct applications to atmospheric retrievals, and a slight decrease of experimental techniques presented.

The number of participants was 65, with particularly remarkable international participation from the United States, Russia, and Belgium. We also had the first participation of an Australian speaker.

During the full three-day meeting, six invited speakers presented relevant talks. They were:

- 1- K. Chance (Cambridge, MA, USA) "Instrumental and spectroscopic requirements for global pollution monitoring from geostationary orbit"
- 2- V.I. G. Tyuterev (Reims, France) "Global and effective models for spectroscopic data reduction involving isotopic substitutions"
- 3- M. Lepère (Namur, Belgium) "Measurement of line profiles and a better determination of line parameters for selected molecules of atmospheric interest"
- 4- D. Romanini (Grenoble, France) "Absorption spectroscopy with high finesse cavities: From high resolution spectroscopy to trace gas analysis"
- 5- J-M. Hartmann (Créteil, France) "Collisional effects on spectral shapes and remote sensing"
- 6- S. Tashkun (Tomsk, Russia) "Global modeling of ro-vibrational line parameters and new generation spectroscopic databanks: applications to CO<sub>2</sub> and H<sub>2</sub>O"

In addition, 42 contributed communications were presented: 28 as posters and 14 as short (20 minute) talks. A large number of interesting discussions, arising from various sessions and a final round table took place. Two main issues were emphasized in discussions:

- 1) As there is a systematic increase of workshops and mini-symposia dedicated to the applications of spectroscopy to atmospheric studies, it is seriously being considered to couple both the HITRAN and ASA conferences. One possibility would be a biennial meeting successively held in the United-States and in Europe. The first one should be in Boston in 2010 and the next one in Reims in 2012.
- 2) The invited talk of Jean-Michel Hartmann clearly pointed out the large errors cast into atmospheric retrievals due to a lack of high accuracy of the spectroscopic laboratory data. It is a necessity to stress this issue to the various world space agencies to financially invest more into the spectroscopic field.

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