

**WMO-GAW / IO3C  
IGACO-O3/UV activity**



# **ACSO- Absorption cross sections of ozone**

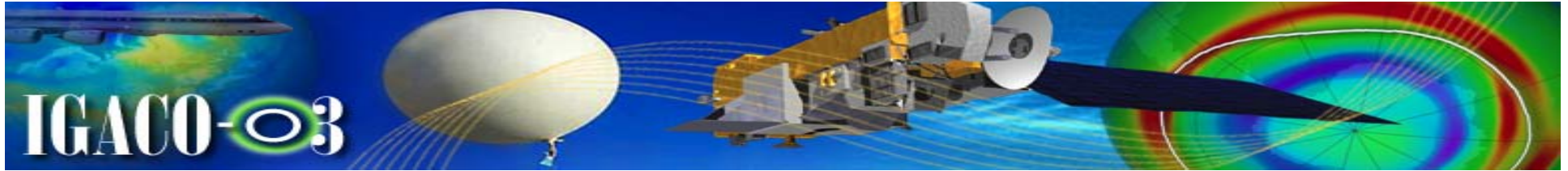
J. Tamminen, J. Orphal, J. Stehelin and G. Braathen

CEOS-ACC, April 28-30, 2015



# ACSO

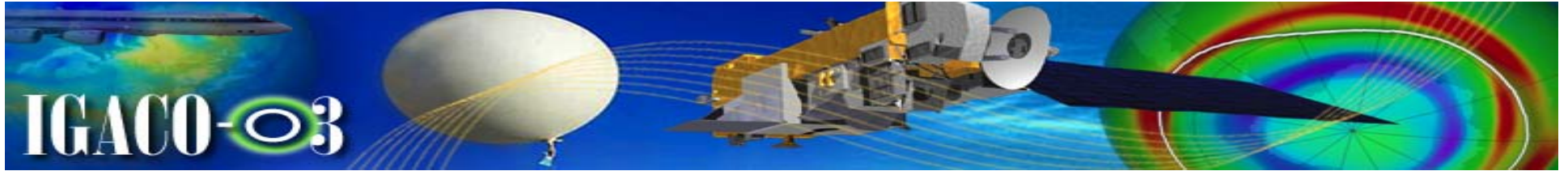
- Evaluate the ozone cross sections and their temperature dependence (Huggins band)
- Understand differences in instruments which are caused by the absorption cross sections
- Recommend, if possible, set of cross sections.
- Several groups participated:
  - Laboratory measurements
  - Ground based instruments
  - Satellite instruments



# ACSO - cross sections

- **BP: Bass ad Paur 1985**
- **BDM: Brion et al., 1993, 1998; Daumont et al., 1992; Malicet et al., 1995**
- **SER: Serdyuchenko et al., 2014, and Gorshelev, et al., 2014**
- Bogumil et al v3 (SCIAMACHY FM)
- Burrows et al 1999 (GOME FM)
- Updated SCIA FM (Bogumil v 4, Chehade 2013)

**<http://igaco-o3.fmi.fi/ACSO>**



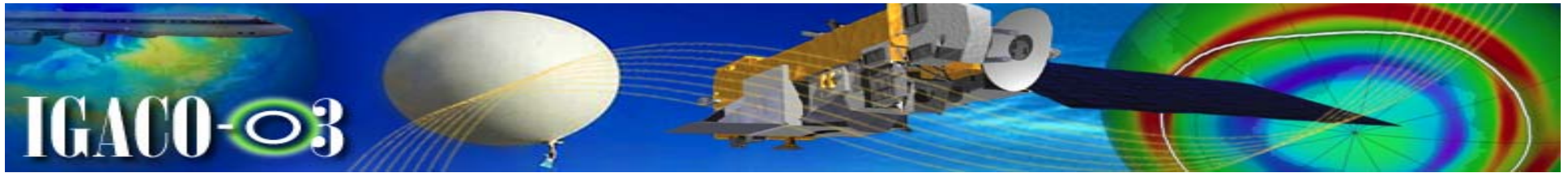
## ACSO status

- After four work-shops, several reports and new cross sections, **this is not the end of the story of ozone cross sections in Huggins band**
- Report of the work so far done has been written.
- Formatting being done at WMO after which it put out for comments at the end of May.
- One month time is given for comments.



## ACSO recommends:

- The spectroscopic data of BP (1985) should **no longer** be used for retrieval of atmospheric ozone measurements.
- For retrieval of **ground-based instruments** of total ozone and **ozone profile** measurements by the Umkehr method performed by **Brewer and Dobson** instruments data of SER (2014) are recommended to be used. When SER (2014) is used, the difference between total ozone measurements of Brewer and Dobson instruments are very small and the difference between Dobson AD and CD measurements are diminished.
- For ground-based **LIDAR** measurements no recommendation is made whether to use BDM (1995) or SER (2014).
- For **satellite retrieval** the presently widely used data of BDM (1995) should be used because SER (2014) seems less suitable for retrievals that use wavelengths close to 300 nm due to a reduction in signal-to-noise in the SER (2014) data set.



## Other outcomes of ACSO:

- the need to continue **laboratory cross section** measurements of ozone of highest quality;
- the importance of careful characterization of the **uncertainties** the laboratory measurements;
- the need to extend the scope of such studies to **other wavelength ranges** (particularly to cover not only the Huggins band but also the comparison with the mid-infrared region), and
- the need for regular **cooperation of experts** in spectral laboratory measurements and specialists in atmospheric (ozone) measurements.