

First Announcement – Save the date!

Second Workshop on “Remote sensing in oxygen absorption bands”

KNMI, De Bilt, Netherlands, 29-31 May 2024

The aim of the workshop is to bring together experts in satellite and ground-based remote sensing, specialists in radiative transfer, and developers of retrieval algorithms for different applications, to inform each other about state-of-art methods and observations related to oxygen absorption bands in the solar spectral range. After the first workshop held in 2016, the second workshop will consider progress in measurements and modelling of oxygen absorption bands used for remote sensing of clouds, aerosols, and trace gases.

Oxygen absorption bands

Atmospheric remote sensing using oxygen absorption bands is increasingly being used for satellite measurements of clouds, aerosols, and trace gases. Since oxygen is a well-mixed gas, its measurement provides altitude and light path information. The idea of using the strongest oxygen absorption band - the O₂ A-band around 760 nm - for cloud altitude determination was already proposed in 1961. Since then, many theoretical studies, laboratory investigations, ground-based, aircraft, and satellite measurements of the O₂ A-band have been performed. Particularly challenging is to simulate the interaction of absorption and scattering processes in the many lines of the A-band. Other oxygen absorption bands, like the O₂ B-band at 687 nm and the O₂ band at 1.26 μm are receiving more attention recently, as well as the O₂-O₂ collision complex bands at UV-visible wavelengths.

Satellite and ground-based observations

Satellite instruments that are (or have been) measuring O₂ bands from space include: GOME on ERS-2, POLDER-1 and -2 on ADEOS, POLDER-3 on PARASOL, MERIS and SCIAMACHY on Envisat, OMI on Aura, GOME-2 on Metop-A, -B, and -C, TANSO-FTS on GOSAT and GOSAT-2, OCO-2, CDS on TanSat, EMI and GMI on GaoFen-5(I/II), EPIC on DSCOVR, OLCI on Sentinel-3, TROPOMI on Sentinel-5P, GEMS on GEO-KOMPSAT-2B, OCO-3 on ISS, and TEMPO.

Future satellite instruments include: UVN/Sentinel-4 on MTG-S1, UVNS/Sentinel-5, 3MI, and MetImage on Metop-SG-A1, FLEX, MicroCarb, and CO2M.

Ground-based observations of O₂ absorption bands include those by MAX-DOAS and TCCON instruments.

Workshop topics

- Spectroscopy of oxygen absorption bands
- Radiative transfer modelling of oxygen absorption bands

- Information content of oxygen absorption bands
- Retrieval and inversion methods
- Satellite observations of oxygen absorption bands
- Ground-based observations of oxygen absorption bands
- Future instruments and satellite missions
- Applications of oxygen absorption bands, including but not limited to:
 - Cloud height
 - Aerosol height
 - Surface pressure
 - Light path statistics
 - Light path correction for CO₂ and CH₄ retrievals
 - Validation of cloud and aerosol height retrievals.

Workshop format

The workshop will have the format of a 3-day plenary meeting, with oral presentations and posters. There will be sufficient time for discussions.

The registration fee is 67 euro, and includes the cost for coffee and lunches. Participants are required to fund their own travel and accommodation costs.

Timely hotel booking is important.

Time schedule

First announcement: 3 November 2023

Second announcement with call for abstracts: 5 January 2024

Abstract deadline: 1 February 2024

Third announcement with program: 1 April 2024

Workshop: Wednesday 29 May – Friday 31 May 2024

Venue: KNMI, De Bilt (NL)

Organizing committee:

- Piet Stammes, KNMI, De Bilt, Netherlands
- Ping Wang, KNMI
- Rene Preusker, Freie Universität, Berlin, Germany
- Jürgen Fischer, Spectral Earth GmbH, Berlin, Germany
- Nicolas Ferlay, LOA, Université de Lille, France

Website: to be announced

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