# Solar UV Radiation

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World Radiation Center

# Introduction to Solar UV Radiation

- Private information – JG

Lecture

- Motivation
- Content
- Leistungskontrolle
- Timetable

# Short Biography

Julian Gröbner, Solar UV Radiation research since 1993.

•1993-1996 PhD thesis on solar UV radiation at the University of Innsbruck, Austria.

•1996-1998 Post-Doc at the Atmospheric Environment Service, Toronto, Canada

•2000-2005 Research Scientist at the Joint Research Centre of the European Commission (JRC) in Ispra, Italy.

Since 2005, responsible for the UV and IR Radiometry section at the Physikalisch-Meteorologisches Observatorium Davos, World Radiation Center, in Davos.

# Coordinates

I can be reached at work:

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# Motivation

## Why a lecture on solar UV Radiation at the ETH?

- Attract students to this research field
- Complementary Curriculum to the ETH Master programme *Atmosphere and Climate*
- Strengthen link between the PMOD/WRC and the ETH
    - Supervise Master and PhD projects

Master Programme, Study Guide, pp33

"*As part of the Master Programme, students will spend some time gaining practical experience working in a professional environment, for instance in an environmental agency (…). Work experience normally takes place in the third term and lasts for a period of at least 18 weeks (~4 months).*"

See www.env.ethz.ch/education/master/training for information concerning this practicum.

# Content of the Lecture
## Solar ultraviolet Radiation

1) Introduction to solar UV radiation
2) History of UV research
3) Extraterrestrial UV radiation
4) Factors affecting UV radiation
    a) Atmosphere
    b) Surface
5) Radiation transfer modeling
6) Radiation measurements
    a) Broadband radiometers
    b) spectroradiometers

1) Calibration methodologies
2) Atmospheric parameter retrieval
    a) Ozone
    b) Aerosols
3) Actinic flux measurements
    a) Retrieval of atmospheric photolysis frequencies
4) UV Climatologies and UV reconstructions

11) Visit to PMOD/WRC ?

# Solar ultraviolet Radiation
# “Leistungskontrolle”

“Leistungskontrolle” for this lecture will be in the form of a “benotete Semesterleistung”. It will be realised through exercises to be done at home and then presented during a following lecture.

The exercises will consist in the use of radiation transfer models which can be run through the internet (http:\\ interface). These exercises will require the knowledge of some fundamental radiation and atmospheric concepts which will be explained in the first lectures. The exercises are therefore scheduled for the second half of the semester and will be in the form of short presentations by each student.

# Solar ultraviolet Radiation
# Timetable

The lecture will be given as a two-hour lecture on every second Wednesday from 15-17. Preliminary dates are:

| 2006 | 2007 |
|---|---|
| 25 October (today) | 10 January |
| 8 November | 24 January |
| 22 November | 7 February (visit to PMOD/WRC ?) |
| 6 December | |
| 20 December | |

Time:
Start 15:15
Break 16:00-16:15
End 17:00

# Solar ultraviolet Radiation
# Script

The lecture presentations will be made available after every lecture on the ftp server:

ftp.pmodwrc.ch/stealth/1560_obs/julian/SolarUV_VL

(login as anonymous)

Unfortunately there are very few books which can be used for this lecture on solar UV radiation. Some information on radiation transfer can be obtained from:

- Radiative Transfer by S. Chandrasekhar, 1960.
- An Introduction to Solar Radiation by M. Iqbal, 1983.

The best textbook is a compilation of lectures given during a summer lecture course in Halkidiki, Greece, in 1995:

Solar Ultraviolet Radiation, Modelling, Measurements and Effects, edited by C.S. Zerefos and A.F. Bais, NATO ASI Series, 1997 ISBN 3-540-62711-1

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