

Lectures 26/28

Review of remote sensing of the atmosphere and oceans

Clouds:

Cloud liquid water content:

Microwave => Lecture 14

Cloud amount/coverage:

Visible+ IR => Lab 9

Cloud type:

IR (ISCCP project) => Lab 9

Cloud particle size distribution and optical depth:

MODIS retrieval technique => Lecture 17 and Lab 9

Cloud thermodynamic phase:

MODIS retrieval technique => Lecture 17

Cloud-top temperature:

IR imagery => Homework 3, Lab 9

Cloud-top pressure:

O₂ absorption technique” and “CO₂ slicing technique => Homework 3,
Lecture 18-19

Cloud height and cloud detection:

Lidars/Radars => Lectures 21, 23 and Lab 12

Aerosols:

Aerosol detection:

TOMS AI => Lecture 11

Aerosol optical depth/particle size distribution/Angstrom exponent:

Sunphotometers and satellite Visible (AVHRR, SeaWiFS, MODIS) =>
Lab 5, Lectures 10, 13 and Homework 2

Stratospheric aerosol optical depth:

Limb visible technique (SAGE) => Homework2

Aerosol extinction-to-backscattering ratio and extinction profiles:

Elastic lidar and Doppler lidar => Lecture 22 and 23

Water vapor:

Integrated column from microwave => Lecture 14

Profile from IR sounding => Lecture 18,19

Profile from Raman lidar => Lab 12 and Lecture 23

Ozone and trace gases:

Ozone amount:

UV downlooking spectrometer (TOMS) => Lecture 11 and Lab 6

Ozone profile:

Sounding (SCIAMACHY) => Lectures 18, 19 and Lab 10

Trace gases:

Sounding techniques => Lectures 18, 19

DIAL Lidars => Lecture 22, G: 8.5

Atmospheric temperature

IR sounding techniques => Lecture 18, 19 and Lab 10

Precipitation

Visible/IR techniques => Lecture 16

Microwave techniques => Lecture 16

Radar => Lecture 21 and Lab 11

Atmospheric winds

Doppler radar => Lecture 25

Sea Surface Temperature

IR split-window technique => Lecture 15 and Lab 8

Microwave techniques => Lecture 15 and Lab 8

Ocean color mapping

Visible imagery (SeaWiFS) => Lectures 5, 13 and Lab 7

Sea ice

Passive microwave => Lecture 5 and Lab 3

Active microwave => Lecture 24

Ocean currents, wind and sea surface height

Visible imagery (SeaWiFS and MODIS) => Lecture 13

Active microwave => Lectures 20, 24