

EAS 4460

Satellite and Radar Meteorology

Fall 2012

EAS 4460 Satellite and Radar Meteorology

Introductory information

- **Dr. Oleksandr Karabanov (Aleks)**
 - Office #1 ES&T L1112
 - Office #2 CULC 331
 - Phones: 404-894-7549, 404-385-6915
 - ok8@mail.gatech.edu
- Lecture notes, announcements, etc.:

T-Square

Goals

- To know and understand:
 - Basic physical principles of operation of Radar and Satellite instruments
 - Limitations and errors of the Radar and Satellite retrievals and techniques
- Be able to interpret common Radar and Satellite data and to analyze real life meteorological phenomena using these data

Syllabus

Date	Class #	Class topic (tentative)
Tuesday, August 21, 2012	1	Introduction, class info, pre-test
Thursday, August 23, 2012	2	History of Radar and satellite meteorology
Tuesday, August 28, 2012	3	Electromagnetic radiation
Thursday, August 30, 2012	4	Propagation of EM waves and radar basics
Tuesday, September 04, 2012	5	Radar hardware, Point targets
Thursday, September 06, 2012	6	Distributed targets, Doppler effect
Tuesday, September 11, 2012	7	V and D aliasing, velocity patterns
Thursday, September 13, 2012	8	Meteo- and Non-meteorological targets
Tuesday, September 18, 2012	9	Hail identification. Attenuation
Thursday, September 20, 2012	10	Rain and Z-R relationships
Tuesday, September 25, 2012	11	Thunderstorms and tornado 1
Thursday, September 27, 2012	12	Thunderstorms and tornado 2
Tuesday, October 02, 2012	13	Thunderstorms and tornado 3
Thursday, October 04, 2012	14	Polarization
Tuesday, October 09, 2012	15	Wind profiling radars
Thursday, October 11, 2012	16	Midterm exam
Tuesday, October 16, 2012	Fall recess	-
Thursday, October 18, 2012	17	Satellite Orbits and Navigation
Tuesday, October 23, 2012	18	Black body radiation
Thursday, October 25, 2012	19	Radiative transfer equation
Tuesday, October 30, 2012	20	Scattering; Clouds; Reflection; Solar radiation
Thursday, November 01, 2012	21	Geostationary satellites
Tuesday, November 06, 2012	22	Polar-orbiting satellites
Thursday, November 08, 2012	23	Clouds
Tuesday, November 13, 2012	24	Vorticity
Thursday, November 15, 2012	25	Tropical cyclones: wind and precipitation
Tuesday, November 20, 2012	26	Scatterometry
Thursday, November 22, 2012	Thanksgiving	-
Tuesday, November 27, 2012	27	Satellite imagery as diagnostic tool
Thursday, November 29, 2012	28	Student presentations (course project presentations)
Tuesday, December 04, 2012	29	Student presentations (course project presentations)
Thursday, December 06, 2012	30	Student presentations (course project presentations)

Dec 13 (Thu) 11:30am -
2:20pm

Final exam (cumulative)

Texts:

1. Radar for Meteorologists (Rinehart)

2. Satellite Meteorology (Kidder & Vonder Haar)

Advanced/additional:

Richard J. Doviak, Dusan S. Zrnic. Doppler Radar And Weather Observations

Remote Sensing of the Lower Atmosphere: An Introduction. Stephens G.
Oxford Univ. Press 1994.

A First Course in Atmospheric Radiation.
Petty G.W., Sundog Publishing. Second Edition.

Class Policies

Grading:

Participation 20% (includes one end-of-lecture current weather analysis)

Mid Term Exam 20%

Final Exam: 30%

Student Presentation 30% of the course grade

Attendance: This is a lecture/seminar based course and attendance is essential as we will be using real time data in our presentations. **Two** un-excused absence is granted per student per semester.

Examples of **excused absences** (documentation has to be provided by the student)

- sickness
- approved Georgia Tech activity (athletic, representing GT, etc)
- car accident
- death in family

Examples of **un-excused absence:**

- overslept
- boyfriend had a birthday
- religious holiday
- my advisor sent me to do field measurements, etc.

Being late to class (more than 5 min late) — two cases of being late equal to one absence