

AOS 740 Spring 2013
Part III: Earth Science Applications of Inverse Theory

Instructor

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Lectures: TTh 1:30-2:50 pm (AOSS 1411)
Office Hours: By appointment

Suggested Reference Materials

1. Stephens, G. L., 1994: *Remote Sensing of the Lower Atmosphere: An Introduction*, Oxford University Press.
2. Bringi, V. N. and V. Chandrasekar, 2001: *Polarimetric Doppler Weather Radar: Principles and Applications*, Cambridge University Press.

Overview

The third unit will apply these radiative transfer and inverse modeling concepts to the problem of observing components of the Earth system from satellite platforms. Both active and passive techniques will be explored including transmission-based, scattering-based, and emission-based retrievals. In each case, relevant current examples will be provided and practical considerations such as non-uniqueness and the role of uncertainties will be discussed. Specific topics covered may vary depending on student interests but will include the remote sensing of surface properties, trace gases in the troposphere, cloud macrophysical and microphysical properties, and precipitation. Two short projects, one illustrating a scalar retrieval problem and the other a vector retrieval, will be assigned to enable students to explore lecture material in greater depth. Together these projects will account for 1/3 of the overall grade for the course.