AAE590: Remote Sensing System Design

Spring 2014
T-Th, 4:30-5:45 POTR 268
Prof. Jim Garrison
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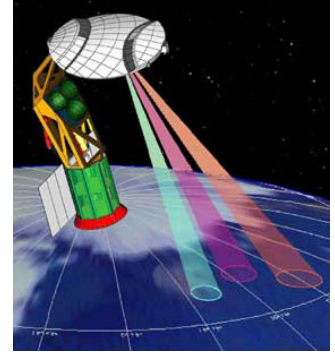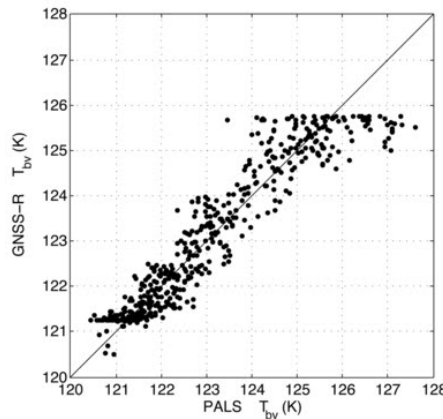
This course will provide students an overview of Earth remote sensing systems including instruments, satellite (and to a lesser degree, airborne) platforms, data processing and orbit/mission design. It is intended for students in both engineering and the sciences who have interests in either the design and development of remote sensing systems, or in the application of remote sensing to their field of study.

Motivation

Observing changes in the Earth's oceans, atmosphere and land masses is a very important activity for understanding both the long-term evolution of our planet and its climate, as well as for near-term prediction of weather and natural disasters. Although some variables describing these processes can be measured directly, with "in situ" sensors, frequent global or regional sampling will require indirect observation using electromagnetic radiation. Scientists in a variety of fields, including oceanography, hydrology, agriculture, planetary sciences and even some social science fields, now make use of remote sensing data. The proper application of remote sensing data and the assimilation of these data into models, requires an understanding of their sources. Remote sensing from satellite or aircraft involves a complex system of interacting components, each of which can have an effect on the accuracy, resolution, and sampling of the desired quantities.

Prerequisites

Graduate standing in engineering or science. AAE301, ECE301 or equivalent (linear signals and systems). AAE203 or equivalent (classical mechanics). Proficiency in a computer programming language. *No background in electromagnetism is required.*

Text and References

Physical Principles of Remote Sensing, W.G. Rees, latest edition. Lecture presentation slides, example research papers, and some additional notes will also be provided.

Assessment

5-6 Extended homework assignment. Individual student research project. Homework will require computer programming and processing of data.