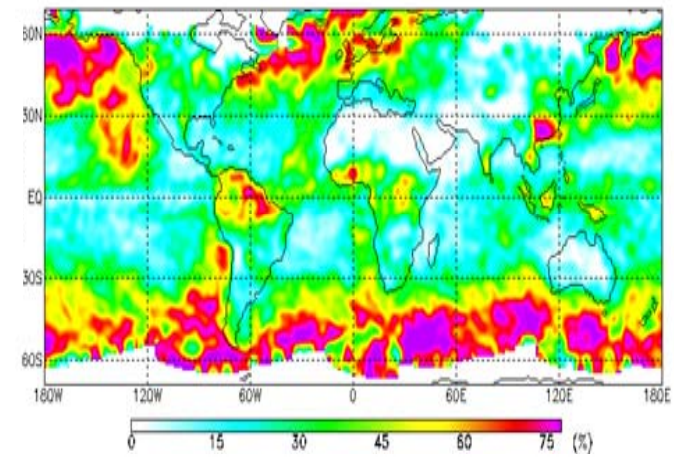
Special Topics
ECEN 5004 Environmental Signal Processing
Fall Semester 2011



Instructor:
Professor A.J. Gasiewski
ECOT 246
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Location and Time:
ECCS 1B14
MF 2:00-3:15 PM

Course Description: Special topics course covering aspect of signal processing relevant to environmental observation, including remote and in situ sensing for Earth observation, environmental prediction, natural resource management, renewable energy, solar, space and planetary science, astronomy, and related applications of sensing and imaging. Course focuses on acquisition, interpretation, and application of sensor and ancillary data in statistical estimation and detection algorithms, including linear, nonlinear, iterative, neural net, and Kalman filter based techniques.

Texts: Course slides by A.J. Gasiewski, 2011, supplemented by supplied text sections and open literature references. Additional texts provided on reserve at the CU Engineering Library.

Topics: Topics include model based parameter estimation, forward problems, transform analysis, estimation and detection, nonlinear estimation, and data assimilation. Applications include numerical weather prediction, GNSS remote sensing, ionospheric sounding, radar, and radiometry, as well as surveillance and target detection and tracking for non-environmental applications.

Prerequisites: Undergraduate level linear systems (ECEN 3300) and probability theory (ECEN 3810), or equivalent. Familiarity with complex numbers, trigonometry, vector algebra, coordinate systems, Fourier transforms, and integro-differential calculus is essential. Familiarity with one of MATLAB / MATHCAD / Mathematica or equivalent computational environments is also required. Familiarity with electromagnetics at the level of ECEN 3410, Electromagnetic Waves and Transmission, or equivalent is valuable.

To be offered only in Odd-Year Fall Semesters (`11,`13,…)

For further information contact Prof. Gasiewski