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Environmental Measurement Problems and Solutions: An Applied Physicists' View

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This overview will address some of the measurement challenges and how persons in his research groups have addressed them. Most of these measurement problems are of chemical nature and are important in atmospheric chemistry and global change. But their research is not limited to that alone. Several examples will be used to illustrate how applied physics can be used to address these measurement problems. The apparatuses are constructed based on theories of signal generation and measurement that include sampling problems, matrix effects, and intrinsic noise statistics. Prototype apparatuses are constructed and tested. Digital and optical signal processing methods are developed specific to the particular apparatus and measurement. Time permitting, specific cases will include analysis of the dielectric spectra of saturated clay soils, fluorine atomic emission detection for alternative fluorocarbon detection, a photothermal apparatus for atmospheric aerosol measurement, and a means to circumvent shot-noise limited detection in Michelson interferometers.

Vljudno vabljeni!