

**THE UNIVERSITY OF ALABAMA IN HUNTSVILLE
MATHEMATICAL SCIENCES COLLOQUIUM**

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**Utilization of Satellite Observations in Air Quality
Studies**

DATE: Friday, October 3, 2014

TIME: 3:00 p.m. – 4:00 p.m.

PLACE: Shelby Center 218

Air quality modeling (AQM) systems play a critical role in air quality decision making practices, and their use is becoming more prevalent. Either a regulatory retrospective modeling, or an air quality forecasting practice, the reliance on model results to make critical decisions demands accurate information from the model. There are many sources of uncertainty in an AQM simulation, emanating from meteorology, emissions, and atmospheric chemistry. However, uncertainties carried over from meteorological simulations have a dominant role as they impact transport, emissions and the chemistry. With the advent of new space-borne remote sensing platforms and the availability of unprecedented observational data, the modeling community is increasingly using these data to reduce model uncertainties. This is achieved by direct assimilation of observations, or indirect assimilation through the recovery of physical properties.

Our group has been involved in utilizing satellite observations in AQMs to improve their performance and to make such improvements available to the air quality community. Examples include the use of geostationary satellite observations to improve boundary layer development, cloud formation, photochemical reaction rates, and the use of trace gas/aerosol observations from polar orbiting satellites to improve air quality simulations. This talk will present an overview of these activities with an emphasis on the mathematical problems involved. Some of the latest results from the activity in which GOES-derived cloud fields are assimilated within Weather Research and Forecasting (WRF) model to improve model location and timing of clouds will be presented.

Refreshments will be served at 2:30 p.m. in SC 201 suite landing