

# **SSEC/CIMSS Seminar**

**MIN M. OO**

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## **Development of High-resolution surface albedo correlation maps for improved resolution and retrieval of aerosols over urban scenes**

Determination of Aerosol Optical Depth (AOD) by satellite remote sensing measurements over land is complicated by the Top of Atmosphere (TOA) reflectance being a combination of the desired atmospheric path reflectance as well as the ground reflectance. Inaccurate surface modeling results in errors in AOD retrieval and reduces spatial resolution. In this presentation, we primarily focus on the use of simultaneous MODIS and AERONET sky radiometer data to refine the surface albedo models regionally and improve the AOD retrieval. We show that the correlation coefficient assumption used in the MODIS Collection (5) model between the VIS and MIR channels used for surface reflection parameterization in urban areas is severely underestimated. This is demonstrated both directly using high spatial imagery data from Hyperion and indirectly by constraining MODIS TOA reflection data with Aeronet Sky radiometer AOD retrievals. Combining the satellite and radiometer measurements allows us to generate a regional VIS/MIR surface reflectance correlation coefficient map at spatial resolutions up to 1.5km. Application of the regional VIS/MIR surface reflectance ratio model is shown to completely remove the bias and reduce uncertainty at the operational resolution of 10km as well as at higher resolutions to 1.5km resolution. Finally, spatial AOD retrievals using the surface albedo model are developed within the CIMSS IMAPP software showing the reduction in artificial AOD hotspots. We explore the angular dependence of the surface albedo, demonstrating that the correlation coefficients are insensitive to scattering angle and errors in using a lambertian assumption are shown to be less than the errors associated in the albedo variability.

**Wednesday, 8 October 2008**

**2:00 p.m.**

**Room AOSS 351**