

**SSEC/CIMSS
Seminar**

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**Comparison of Different Inversion
Techniques for Daytime Cloud Optical and
Microphysical Parameters Retrieval**

In February 2009, EUMETSAT sponsored a second workshop to compare the various cloud algorithms applied to MSG/SEVIRI data. One obvious result of this effort is that significant differences remain even for the same products generated from the same dataset with algorithms that employ similar approaches. For example, all of the cloud daytime optical and microphysical algorithms employ the Nakajima & King approach driven by simultaneous measurements in a visible conservative scattering channel (SEVIRI: 0.6 μm or 0.8 μm) and an absorption channel in the NIR range (either 1.6 μm or 3.9 μm). The algorithms differ basically in the RTM, inversion method, ice particle scattering property models, and the use of ancillary data sets. Most algorithms use pre-calculated look-up-tables (LUT) to speed up the forward calculations.

Multiple algorithms use the optimal estimation inversion technique. The product comparisons highlighted the high sensitivity of the optimal estimation algorithms to the a-priori assumption of the effective radius. This is important because the frequency distribution of long-term observations, such as monthly means, can be impacted significantly by the a-priori values for effective radius. The goal of this study is to compare different inversion techniques and to evaluate them for case studies as well as for Level-3 cloud product generation. We applied a number of different techniques to MSG scenes: A 1D-var optimal estimation technique with different a-priori assumptions and tuning parameters (e.g. step size and convergence criteria), a genetic algorithm code, an artificial neural network approach, a particle swarm optimization.

Friday, 13 November 2009

11:00 a.m.

Room AOSS 351