Geophysical Research Abstracts,
Vol. 11, EGU2009-3222, 2009
EGU General Assembly 2009

Technique to retrieve the spectral aerosol optical thickness and surface reflectance using fast radiative transfer code and its application to MERIS measurements

E. Zege (1), I. Katsev (1), A. Prikhach (1), A. Ivanov (1), and A. Kokhanovsky (2)

(1) B.I.Stepanov Institute of Physics, National Academy of Science of Belarus, , Minsk, Belarus (epzege@yahoo.com), (2) Institute of Environmental Physics, Bremen, Germany

We will present a new Aerosol Retrieval Technique (ART) to retrieve aerosol optical thickness (AOT), Angstrom parameter, and land reflectance from satellite data. The most important difference of the ART code from MODIS, BAER and some other well-known codes is that the ART does not use the LUT technique but instead of it deploys our earlier developed extremely fast code RAY for radiative transfer (RT) computations.
Using the RT computations in the course of the AOT retrieval allows one to include any available local models of molecular atmosphere and of aerosol in upper and middle atmosphere layers for the treated area. Any set of wavelengths from any satellite optical sensors can be processed. Moreover, we use the method of least squares in the retrieval of optical parameters of aerosol because the RAY code provides the derivatives of the radiation characteristics with respect to the searching for system parameters. This technique allows the optimal use on multispectral information if it is available. These features may be considered as definite merits in comparison with the LUT technique.
But the main question in the case is a time of calculations because of need to process a large amount of pixels. At present, the retrieval of the AOT, Angstrom parameter, and land reflectance for the area with 105 pixels is processed for about 30 minutes at usual PC. We have been developed even faster semi-analytical technique that uses the combination of analytical solutions and numerical computation that will be shortly presented as well.
The comparison of data retrieved using ART algorithm with results of some other well known algorithms (MERIS ESA, MERIS BAER, MODIS NASA, etc.) and with Aeronet measurements will be demonstrated.