

Report

Community Radiative Transfer Model (CRTM) Technical Sub-Group

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CRTM Technical Sub-Group (CRTM TSG)

- The CRTM Technical Sub-Group has been initiated at Lotte Jeju Hotel on March 27, 2014.
- The first CRTM TSG meeting was held at Lotte Jeju Hotel on March 27, 2014.
- CRTM Components and Functionalities.
- Community Line-by-line Model (CLBL)
- Community Surface Emissivity Model (CSEM)
- Future Development

CRTM 2.1.3 Release

CRTM 2.1.3 was released on Jan. 14, 2014 and can be downloaded from <ftp.emc.ncep.noaa.gov> .

- ODAS and ODPS transmittance models
 - Aerosol optical property functions
 - Cloud optical property functions
 - Versatile surface emissivity/reflectance models: Fastem5, Wu and Smith IR, Ocean BRDF, empirical and physical models, database, LUT
 - ADA and SOI radiative transfer algorithms
 - Option structure I/O
 - Non-LTE for hyperspectral infrared sensors
 - Zeeman-splitting
 - Stratosphere Sounder Unit
 - Channel subsetting
 - Number of streams option for scattering atmospheres
 - Scattering switch option for clouds and aerosols
 - Aircraft instrument capability
 - Overcast radiance array
- Contact the CRTM team at ncep.list.emc.jcsda_crtm.support@noaa.gov

Future Development

- Full Stokes RT
- Community Surface Emissivity Model (CSEM)
 - + Land bidirectional Reflectance Distribution Function
 - + Ocean bio-optic model
- Finalize the un-apodized radiance simulation capability
- Multiple Aerosol Optical Models
- Optimize CRTM efficiency
- Active Sensor simulators
- CLBL

Polarization effect on ocean-color product

$$\mathbf{I}_m = \mathbf{M} \mathbf{R}(\alpha) \mathbf{I}_t$$

$$I_m = I_t + m_{12}(Q_t \cos 2\alpha + U_t \sin 2\alpha) + m_{13}(-Q_t \sin 2\alpha + U_t \cos 2\alpha) \quad \text{of instrumental error considered}$$

$$m_{12} = P_{in} \cos 2\chi_{in}, \quad m_{13} = P_{in} \sin 2\chi_{in}$$

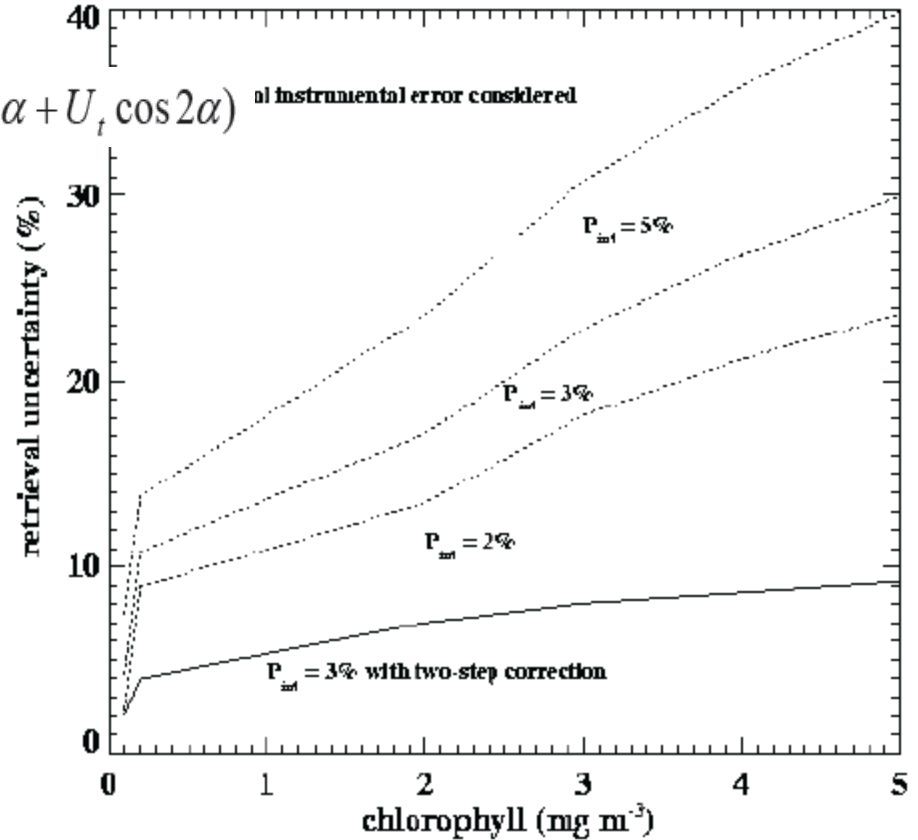
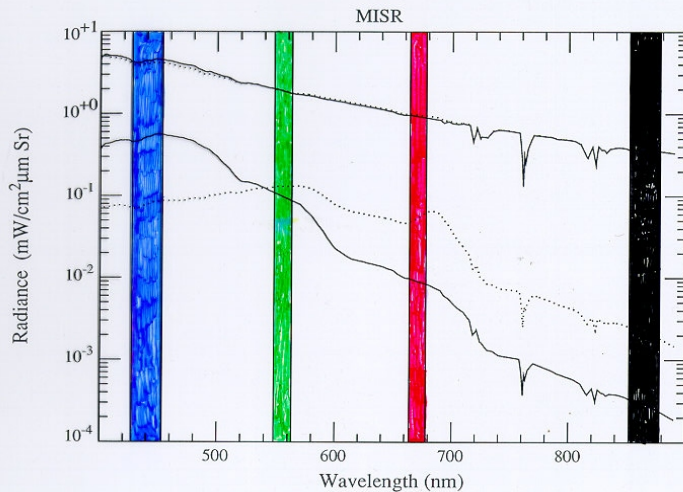


Figure 20. Retrieval uncertainty for various polarization sensitivities. The two-step algorithm yields the best results.

Water-leaving radiance for high (dotted) and low (lower solid) chlorophyll. Upper curves are with atmospheric signal. Online downloaded figure.