



Community Radiative Transfer Model (CRTM) Development

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Other contributors



- Weizhong Zheng, NCEP/EMC
 - Microwave land surface emissivity
- Tom Greenwald, UWisc/SSEC/CIMSS
 - SOI RT algorithm
 - Scattering indicator
- Yong Han, NESDIS/STAR
 - Non-LTE radiance correction
 - Zeeman effect
- And many others...



Overview



- Multiple transmittance algorithms.
 - ODAS, ODPS, ODSSU
- Non-LTE model for radiance correction.
- Zeeman model additions (DMSP-20).
- Microwave sea surface emissivity model (FASTEM5).
- Microwave land surface emissivity model updates.
- Use of land surface atlas emissivities via separate tool.
 - Testing TELSUM, CNRM, UWIRemis.
- Scattering switch.
- Implementation of additional RT solvers.
 - Successive Order of Interaction (SOI) algorithm implemented. Under review.
 - Additional algorithms being considered (VDISORT) for research use (fast, but too slow for operational use).
- AOD computation functions
 - Used by air quality investigators/forecasters.
- Aircraft model
 - User supplies an aircraft flight level pressure to turn this option on.
- Channel selection capability
 - Currently ALL channels for a given sensor are processed.
 - Selection capability allows users to turn off the processing of unwanted channels.
- User specified number of streams
 - Rather than the (currently unsophisticated) auto-select of the number of streams, users can input their own value.



Future plans

- Scattering Indicator (Tom Greenwald)
 - Use of a weighted, vertically integrated scattering coefficient to determine an optimal number of streams.
- Updates to allow code to be used in single-precision mode
 - Double-precision is default.
 - For use in GSI single-precision model.
 - Only a few places need attention for compilation, but stability needs to be ascertained.
- Update of microwave line-by-line model
 - Currently using Rosenkranz model.
 - Switching to MonoRTM (from AER Inc).
- Update of ATMS coefficients using spectral response functions
- Development of empirical snow/ice model for ATMS.
- Threading of the CRTM.
- Changes to CRTM interface (**surface** structure) to allow specification of multiple surface sub-types.