Community Radiative Transfer Model (CRTM) Status

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The Community Radiative Transfer Model (CRTM) is the operational model developed jointly by the partners of the US Joint Center for Satellite Data Assimilation (JCSDA) and JCSDA-funded research groups. This talk will discuss the current status and future development plans for the CRTM. The current implementation includes modules to compute atmospheric transmittances, optical parameters for several cloud and aerosol types, surface emissivity and reflectivity for ocean, land, ice and snow surface types, and a multiple stream radiative transfer solution. The current CRTM supports many infrared and microwave sensors, including hyperspectral sensors such as AIRS and IASI. The ongoing and planned development of the CRTM includes the implementation of a transmittance model for SSU that takes the leakage of the CO_2 cell pressure into account, improvements in the CompactOPTRAN transmittance model, implementation of multiple atmospheric transmittance algorithms such as those used in RTTOV and SARTA, implementation of an algorithm to add extra layers at the top-of-atmosphere (TOA) as required to prevent large valued temperature Jacobians at TOA, implementation of a new low-frequency microwave sea surface emissivity model, implementation of a fast radiative transfer model that takes the Zeeman effect into account, investigation of a new infrared land surface emissivity model from NRL, improvement of the computational efficiency of the current Advanced Doubling-Adding (ADA) radiative transfer solver, and implementation of the Successive Order of Interaction (SOI) radiative transfer solver developed at the University of Wisconsin.

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