

CRTM / RTTOV technical subgroup

Benjamin Johnson and James Hocking

ITSC-21, Darmstadt, 30 November 2017

CRTM / RTTOV overview

CRTM v2.3 released.

CSEM: Ming Chen is working on interfacing this with CRTM and RTTOV.

CRTM-OSS is being finalised.

CASM (active sensor capability) current implemented for radars, plans to extend to lidars.

Release coef generation software to users.

Extend to full Stokes vector.

RTTOV v12.1 released Feb 2017.

RTTOV v12.2 due in Mar 2018.

RTTOV v12.3 due in Mar 2019.

RTTOV v13 due in 2020.

RTTOV website: all IR SRFs available, MW passbands, LBL vs RTTOV stats.

RTTOV user survey.

Radiance Simulator.

RTTOV-gb – for ground-based MW sensors.

Discussion points

F16 has lost phase-lock so we require updated coefficients for both CRTM and RTTOV.

SRFs for MW sensors should be used routinely.

Land surface emissivity models with simple surface variables to allow retrievals. (CSEM has such a model).

Request that RTTOV MTG-IRS coefficients be routinely trained up to large zenith angles (~85 degrees).

TESSEM2 adjoint: question about stability of AD of neural nets. James didn't see any problems so far with implementation, but will test further.

Discussion points

Slant path and 3D effects (e.g. surface shadowing, 3D cloud effects): both models treat slant path simplistically.

RTTOV plans to address 3D cloud effects in the future. Leonhard Scheck has done something simple for the MFASIS fast visible cloud model.

CRTM to treat 3D effects via more sophisticated slant path approach.

Can we add additional gases? For fixed gases, yes. For variable gases this is not trivial, although for certain species with properties which vary slowly across hyperspectral channels (for example) it might be possible to treat them specially. There are fundamental limits to how many gases the effective transmittance parameterisations can handle (e.g. 10 or 20). There are RTTOV plans to investigate an alternative optical depth parameterisation which could make it easier to add new species.