2021-05-27

CRTM Monthly Meeting Protocol

Core Topic of the Meeting: ITSC-23 and Roundtable discussion

Date: 2021-05-27 **Time**: 15:04h

Location: Virtual (Google Hangouts)

Invited Speakers: -

Meeting Chair: Benjamin Johnson (JCSDA)

Keeper of the Minutes: Patrick Stegmann (JCSDA)

Attendees: Benjamin Johnson, Patrick Stegmann, Cheng Dang, Andrew Tangborn, Yingtao Ma, Shih-wei Wei, Scott Sieron, Nick Nalli, Yan Qiu, Jim Yung, Hongli Wang, Mariusz Pagowski, Daniel Abdi, Haidao Lin

[Initial discussion about UPP aerosol loading issues between Ben and Andrew.]

A g n d a lt e m 1:	ITSC-23 announcement
Di s c u s si o n:	Introduction by Ben: Ben: We will have the JCSDA Technical Review meeting this month and a kickoff meeting for AOP2021 once Kevin is getting back at me regarding in-kind contributions. Alright, let's get started. I didn't advertise this meeting because it's going to be very lightweight. We have the JCSDA meeting and at the end of June we have the ITSC-23 meeting. Marco and I are working on the Radiative Transfer Working Group meeting on June 15. Then we have the CRTM-RTTOV subgroup on June 14. That will be focusing on myself and James Hawking where we will be assessing the specific issues between CRTM and RTTOV and that is something that Cheng is looking into right now. I have been set in charge of the OBS team, so the CRTM 2.4.1 release has been slowed down to July. I was hoping that Mark Liu would show up today, based on that information he would work on including the CRTM3.0 updates.
R e s ul t:	N/A

T a s k s:	N/A
R e s p o n si b l e P e o pl e:	N/A
D e dl in e:	N/A

A g n d a lt e m 2:	Round Table Discussion
D c u si o n:	Ben: Maybe we can go around the table and have a brief overview of what people have been working on. Let's start with Patrick. Patrick: Yes, I have been adding the antenna coefficients to MHS MetOp-C and started working on two new MW instruments, including GEMS. The IASI-NG calculations on S4 are going slowly because of the sheer number of jobs and I have already received complaints from the admin. At the end of June will be the release of the CRTM transmittance coefficient generation package, so I am planning to have a coordination meeting and June will be characterized by testing and documentation.
	Ben: Will this be a test release?
	Patrick: Well, it will probably be an expert release to the extent that the AOP specifies it.
	Cheng: With AOP2021 we have wrapped out all the aerosol coefficient development. If anyone is interested you can check it out. Right now, I am looking into RTTOV aerosol coefficients. Recently I am looking into having those interfaces ready for radiances and reflectance evaluation.
	Ben: The ultimate goal is to have a look at the MFASIS model of RTTOV and to improve the UV/VIS capabilities of the CRTM. Yingtao, do you have any updates for us?
	Yingtao: I am working on the ABI GOES coefficient generation and there is also a request for a hyperspectral MW instrument in cooperation with the university of Colorado. We found that there is a difference between the Liebe-Rosenkranz setup in the CRTM and MonoRTM. There are probably some weak lines that are not considered in the current CRTM.
	Patrick and I are doing coefficient generation, so it might be good to have a coordination meeting to specify who does what.

Ben: I spoke with Kevin and he said that everybody should work on the JCSDA repository. I will have our kickoff meeting for the AOP in June and discuss these things.

Yingtao: With the CRTM we have a person of contact for every aspect. It's a little bit messy when people outside the team select someone who is familiar with them. I would like to have a clear assignment instead of having randomly selected people.

Ben: The AOP really specifies who is supposed to work on what and Kevin is fully onboard with that. Patrick, could you set up a separate coordination meeting for the coefficient generation?

Patrick: Yes, my idea was to have that as part of the coefficient generation package release meeting.

Ben: Nick, do you want to give an update on the SSEM work?

Nick: So, we have a version 2.1 that has been brought into the CRTM. Jim Yung has been testing that and he said that there are still areas in the LW IR that are not corrected. That is not surprising because right now I can see temperature dependence where there is none. Right now, I am using this dataset of Row et al., 2001 with interpolation. The next step is what I am looking at now, to re-derive refractive indices that where published in the Pinkley, 1977 paper. Using those data, we can use the Kramers-Kronig analysis to derive the phase shift and from that we can derive the refractive indices and this is a quite intriguing idea that I have been working on a while. What is really interesting is that the KK analysis is working correctly but there is a formula and there is something that is offset by a negative sign or an angle that is off by pi. And I haven't figured out where the inconsistencies are. I figured it's very important to see where this is coming from. Then I will calculate the refractive indices and recompute the LUTs and give them to Ming.

Ben: I was hoping Ming would be here.

Nick: I might be running a little bit behind because of this issue with the phase shift. I will be talking with you and Patrick offline.

Ben: You are probably right with the phase shift. I wonder if it could just be a convention issue?

Nick: That might be it. It seems that this is exactly where it's coming from. It's these old papers, they have these formulas and they skip steps and it's not clear how they got from here to there. And one of these formulas has a spurious negative sign in there. But I don't want to assume it's an error because it would cause a negative absorption coefficient, so I am trying to retrace these equations myself.

Ben: Yes, loop me into this discussion.

Nick: I will.

Ben: Thanks a lot. Are you going to ITSC?

Nick: Yes, I have a poster on updates on the ITSRC. I might be taking some vacation midway through the meeting, so if the poster is late someone else might present it. But I would like to present in the RT meeting.

Ben: [unintelligible]

Nick: I took a look at his slides and it looks like interesting stuff that we have to utilize at some point.

Ben: Thanks a lot. Anybody else want to give an update? Mariusz is on the line.

Mariusz: Let's see, for the CRTM we haven't done much recently. We are using NASA tables to compute AOD in real-time. And that hopefully will become operational at NCEP, maybe in two years or so. The system is very strong with LetKF and in JEDI, so we are quite happy with the performance. I have a question for you: Hongli said you also implemented NASA tables? We could extend our current UFO to add NASA coefficients.

Cheng: Yes, Mariusz you are right. I did implement the NASA tables in the current CRTM. I agree that only concerning AOD we can use this table. But I discussed with Ben that we should do radiance assimilation. If you are interested in looking at a branch I can talk to you.

Mariusz: Yes, I would like to learn how to do radiance assimilation. It is an extra step to do the retrievals. A related issue is that because AOD is such an integral quantity, we are looking for ways to validate our tables. Do they have backscattering coefficients?

Cheng: Yes.

Mariusz: So, it would be pretty straightforward to use this in the Forward calculations?

Ben: This is something that Isaac and I are working on, to have lidar and radar.

Mariusz: Isaac Moradi?

Ben: Yes, you might want to contact him.

Ben: Scott, is the antenna correction file working?

Scott: Yes, thank you Patrick.

Ben: Anyone else want to give an update?

Hongli: High, over the last month I have been working on the aerosol coefficients.

Ben: The NASA tables, are they from Mariusz?

Hongli: Yes, that was suggested by Mariusz. Previously I was using Cheng's branch but I recently updated to develop and it works. So, in the next cycle we may do some case studies with the roof-CMAQ model. But right now, we are not using Mariusz model. When I have some results, I will update you.

Ben: So, one of the things we want to do for AOP2021 is to have ways we can validate our assumptions. Maybe later in the year we can have a database with measurements to validate our assumptions. I was working with Andrew Heymsfield to validate scattering properties and I want to extend that to have field and ground measurement data to constrain our scattering properties. We also have issues concerning the wettability of particles. I'll definitely touch base with everybody once this is going.

I don't see anyone from UPP on. I'll touch base with Greg Frost on the UPP issue. Anyone else want to give an update on CRTM activities.

Sarah Lu: What AOD issue did you discuss?

Andrew: They found a bug in the UPP where they would get double the AOP. Since a lot of the emissions were tuned to get the same ones as e.g. AERONET. And that does have an impact on what the CRTM is computing.

Ben: UPP is not our only reference	e, but we get feedback from them.	That is a very important piece of information.
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Sarah: I recall recently they can update the LUTs for UPP. So, it's using the same table as CRTM.

Ben: I have sent an email to Greg Frost. Hopefully we can get to the bottom of this.

Mariusz: No, this is strictly a UPP issue.

Ben: Alright, I think we have a short meeting today. Again, if you are going to the ITSC, we have this RT meeting. We also have the JCSDA meeting in June.

Mariusz: Ben, can I ask what the ITSC is?

Ben: It's the TOVS workshop, it's probably too late to joing. We also have the RT working group with myself and Marco Matricardi. I don't know how they want to restrict access however, since it's not a private link and no registration fee.

Thank you for your attendance.

R e s ul t:	N/A
T a s k s:	N/A
R e s p o n si bl e P e o pl e:	N/A
D e a dI in e:	N/A