

2019 International Workshop on Radiative Transfer Models for Satellite Data Assimilation

Satellite observations have a major positive impact on the accuracy of Numerical Weather Prediction. They are used in advanced Data Assimilation systems, including variational, ensemble and hybrid methods. In order to assimilate satellite observations directly, which is proven to be most effective, a fast and accurate radiative transfer model is essential. Many countries have invested in developments of fast radiative transfer models through their space and NWP programs. As the capability of these models has improved, the range of satellite data that can be successfully assimilated has increased. For example



the use of observations in areas of cloud and precipitation, that were initially excluded from assimilation, has become very successful. In 2019, the Chinese Meteorological Administration (CMA), the European Centre for Medium-Range Weather Forecast (ECMWF) and US Joint Center for Satellite Data Assimilation (JCSDA) will jointly hold an international workshop in Beijing, China on radiative transfer models in support of satellite data assimilation. The specific goals of this workshop will be (1) reviewing the current capabilities of fast radiative transfer models, (2) understanding new requirements on radiative transfer models for satellite data assimilation, and (3) prioritizing new developments of superfast computation in atmospheric and surface radiative transfer processes. New aspects can in particular cover developments for observations sensitive not only to the atmosphere, which is often well represented by existing models, but other Earth System components (e.g. ocean, sea ice, snow, land, atmospheric composition). It will also address, where appropriate, shortcomings in the models that fast models are trained on, such as line-by-line transmittance models.

International Organizing Committee: Steve English, Ben Johnson, Marco Matricardi, Catherine Prigent, Fuzhong Weng, Peng Zhang

Local Technical Committee: Fuzhong Weng, Peng Zhang, Qifeng Lu, Hua Zhang, Wei Han, Jun Li

Workshop Venue: Hotel Pan Pacific Tianjin, China

Time: April 29 - May 3, 2019

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Agenda

Monday April 29, 2019

Registration			9:00am-14:00 pm
			Start time
Opening Remark from CMA Deputy Administrator, Dr. Xinwen Yu			14:00
Session 1: Understanding the Requirements on Radiative Transfer Model <i>Chair: Peng Zhang and Mitch Goldberg</i>			
Presenter	Affiliation	Title	
Peng Zhang	CMA	Global satellite programmes and requirements for radiative transfer models	14:20
Mitch Goldberg	NOAA	WMO GSICS requirements on radiative transfer	14:50
Stephen English	ECMWF	Applications of radiative transfer models in NWP data assimilation and re-analysis	15:20
Tea/Coffee Break			15:50
Qifeng Lu	CMA	CMA applications of radiative transfer model in product generation and sensor monitoring	16:20
Quanhua Liu	NOAA	Community Radiative Transfer Model (CRTM) for NOAA Remote Sensing Data cal/val and Products	16:50
Discussion			17:20
Close of Day			17:50

Tuesday, April 30, 2019

Session 2: Capabilities of Current Fast Radiative Transfer Model <i>Chair: Stephen English and Jiancheng Shi</i>			
Presenter	Affiliation	Title	Start time
Marco Matricardi	ECMWF	Overview of fast model approaches and current issues	8:30
Roger Saunders	Met Office	RTTOV software design issues	9:00
Ben Johnson	JCSDA	CRTM software design issues	9:30
Tea / coffee break			10:00
Jun Yang	CAMS/LaSW	ARMS development plan	10:20
Andrew Collard/Emily Liu	NOAA	RTTOV CRTM Intercomparisons at NCEP	10:50
Gang Ma	CMA	RTTOV performance evaluation	11:20

Lunch break (12:00-1:30)

Session 3: Capabilities of Advanced Radiative Transfer Models			
<i>Chair: Andrew Collard and Roger Saunders</i>			
Presenter	Affiliation	Title	Start time
Knut Stamnes	Steven Inst Tech.	Ocean and atmosphere coupling radiative transfer modeling	13:30
Hua Zhang	CMA	Current issues in radiative transfer scheme for climate models	14:00
Bingqiang Sun	Fudan Univ	Current issues in vector radiative transfer model	14:30
Tea/Coffee Break			15:00
Xudong Liang	CAMS/LasW	Assimilation of Doppler radar radial velocity	15:30
Chao Liu	NUIST	Principal component radiative transfer model	16:00
Biqing Yi	Sun Yat-sen Univ	Improved Ice Cloud Modeling Capabilities in Community Radiative Transfer Model	16:30
Discussion			17:00
Close of Day			17:30

Wednesday, May 1, 2019

Session 4: Optical Properties of Gases, Aerosols, Clouds and Precipitation			
<i>Chair: Marco Matricardi and Kozo Okamoto</i>			
Presenter	Affiliation	Title	Start time
Eli J. Mlawer	AER	Line-by-line modeling at AER: Perspectives and recent spectroscopy studies	8:30
Lei Bi	Zhejiang Univ	Issues in aerosol and cloud radiative transfer modeling	9:00
Yoshifumi Ota	JMA	Evaluation of RTM and models for MW and IR all-sky assimilation	9:30
Leonhard Scheck	LMU	Current issues in cloud and precipitation optical modeling: Visible	10:00
Tea/Coffee Break			10:30
Zhengqian Li	CAS	Aerosol polarization radiative transfer simulation	11:00
Chen Zhou	Nanjing Univ	Simulating the lidar returns of clouds with a Monte Carlo radiative transfer model	11:30

Lunch break (12:00-1:30)

Session 5: Surface Reflectivity and Emissivity Modeling			
<i>Chair: Ben Johnson and Knut Stamnes</i>			
Presenter	Affiliation	Title	Start time
Jiancheng Shi	CAS	Optical and microwave surface model	13:30
Ming Chen	UMD	Land surface models for infrared and BRDF	14:00
Heather Lawrence	ECMWF	Ocean surface dielectric model	14:30
Tea/Coffee Break			15:00
Fuzhong Weng	CAMS/LaSW	Land surface MW emissivity model	15:30
Wei Han	CNWC	Assimilation of surface sensitive channels in GRAPES	16:00
Discussion			16:30

<i>Close of Day</i>	17:30
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Thursday, May 2, 2019

Session 6: Prioritization			
<i>Chairs: Fuzhong Weng, Stephen English, Ben Johnson</i>			
<i>Presenter</i>	<i>Affiliation</i>	<i>Title</i>	<i>Start time</i>
1.5 hour discussion	Discussion on the priorities for RTMs in US, Europe and China		9:00
Tea/Coffee break			10:30
Session 7: Conclusions			
<i>Chairs: Stephen English, Fuzhong Weng, Ben Johnson</i>			
<i>Presenter</i>	<i>Affiliation</i>	<i>Title</i>	<i>Start time</i>
1.0 hour	Presentation of key conclusions, recommendations and actions from discussion sessions		11:00
<i>Adjourn</i>			12:00

Friday, May 3, 2019

<i>Departure</i>	8:00am
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