1ˢᵗ International Summer Snowfall Workshop

28 – 30 June 2017

Institute for Geophysics and Meteorology
University of Cologne, Pohligstr. 3, Cologne, Germany

Agenda

Wednesday, 28th June

12:00 - 13:00	Registration, in front of HS 4.001, 4ᵗʰ floor
13:00 - 13:30	Welcome and opening remarks

Session 1: Motivation and Current State
Chair: D. Moisseev

13:30 - 14:00	**Invited Keynote:** Scattering databases for all-sky data assimilation in global weather forecasting *(Alan Geer)*
14:00 – 14:30	**Invited Keynote:** Towards consistent simulations of active and passive measurements of hydrometeors *(Patrick Eriksson)*

14:30 – 15:00   **Coffee Break**

Session 2: Scattering Databases
Chair: A. Geer

15:00 - 15:30   **Invited Keynote:** Scattering databases for ice and snow particles in the microwave *(Jani Tyynelä)*

15:30 - 15:45   Active and passive radiative transfer modeling with preferentially-aligned particles *(Ian Adams)*

15:45 - 16:00   A general database of single scattering properties of ice particles at microwave and sub-millimetre frequencies *(Robin Ekelund)*

16:00 - 16:15   The OpenSSP scattering database *(Kwo-Sen Kuo)*

16:15 - 18:00   **Discussion of Session 1+2, Workshop Expectations**

18:00 - 22:00   **Icebreaker**

Thursday, 29th June

Session 3: Snow Particle Models and Observational Constraints
Chair: I. Adams

09:00 - 09:30   **Invited Keynote:** Physics-based simulation of snowflakes *(Jussi Leinonen)*

09:30 - 09:45   Comparison of different snowflake models and in-situ measurements in Finland during the winter of 2014 *(Jani Tyynelä)*

09:45 - 10:00   Constraining snow particle models via in-situ observations *(Norman Wood)*

10:00 - 10:15   Constraining the choice of scattering model for snowflakes using triple-wavelength radar - and plans for a new field campaign *(Chris Westbrook)*

10:15 - 10:30   How well-constrained are retrievals of the ice particle size distribution from co-located, multi-frequency radar and passive microwave measurements? *(Stephen Munchak)*

10:30 - 11:00   **Discussion of Session 3**

11:00 - 11:30   **Coffee Break**

11:30 - 12:15	**Invited keynote:** Lesson's learned from building a scattering database structure including polarimetry and oriented particles *(Eugene Clothiaux)*
12:15 - 12:45	Initial concept for a scattering data structure *(Stefan Kneifel, Jussi Leinonen, Eugene Clothiaux)*
12:45 - 13:00	Introduction to Breakout Sessions (*Stefan Kneifel, Dmitri Moisseev*)

13:00 - 14:00	**Lunch and Posters**

Breakout Sessions

14:00 - 16:00	**Breakout Session A: Scattering Data Structure and Conventions** *(Chairs: S. Kneifel, J. Leinonen)*
14:00 - 16:00	**Breakout Session B: User Requirements and Validation** *(Chairs: D. Moisseev, A. Geer)*

16:00 - 16:30	**Coffee Break**

16:30 - 18:00	**Report from Breakout Sessions, Plenary Discussion**

19:00	**Hellers Brewery** (Roonstrasse 33, Tram Stop "Zülpicher Platz")

Friday, 30th June

Session 4: Easy Scattering - Tools and Approximations
Chair: R. Honeyager

09:00 - 09:20	Online demonstration: An Application Programming Interface for Synthetic Snowflake Particle Structure and Scattering Data *(Matthew Lammers, Kwo-Sen Kuo)*
09:20 - 09:40	Online Demonstration: SnowPort: A discussion and exchange platform related to snowfall *(Davide Ori, Stefan Kneifel)*
09:40 - 09:55	Self-similar Rayleigh Gans Approximation *(Chris Westbrook)*

09:55 - 10:30	**Discussion of Session 4**

10:30 - 11:00   Coffee Break

Session 5: Scattering Methods and Impact of Snow Microstructure
Chair: C. Westbrook

11:00 - 11:15   Evaluation of the Rayleigh-Gans and Self-similar Rayleigh Gans Approximation for rimed particles *(Jussi Leinonen)*

11:15 - 11:30   Multi-Frequency radar/passive microwave retrievals of cold season precipitation from OLYMPEX data *(Frederic Tridon)*

11:30 - 11:45   A computationally efficient 3D Full-wave Model for coherent EM scattering from complex-geometry hydrometeors *(Ines Fenni)*

11:45 - 12:00   The impact of microstructure on an accurate snow scattering parametrization *(Ryan Honeyager)*

12:00 - 12:15   Linking the structure of the internal electric field of ice particles to calculations of the scattered field *(Karina McCusker)*

12:15 - 12:30   Discussion of Session 5

12:30 - 13:30   Lunch and Posters

Session 6: Observations and Retrievals of Snowfall Properties
Chair: A. Berne

13:30 - 13:45   Turbulence and temperature effects on hydrometeor orientation and fallspeed *(Tim Garrett)*

13:45 - 14:00   Microstructural properties of snowfall in the Swiss Alps using pictures collected with a Multi-Angle Snowflake Camera *(Christophe Praz)*

14:00 - 14:15   Riming in alpine snowfall *(Josué Gehring)*

14:15 - 14:30   Statistically representation of in-situ properties of ice and snow particles during The Olympic Mountain Experiment *(Paloma Borque)*

14:30 - 14:45   Polarimetric radar signatures at X-band towards ice classification and quantification *(Silke Trömel)*

14:45 - 15:00   Polarimetric Doppler observations of ice particles with scanning 94 GHz cloud radar *(Alexander Myagkov)*

15:00 - 16:30   Final Discussion, Workshop Recap, Adjourn

Poster Presentations (Posters will be up during the entire Workshop)

P.1 Accurate calculations of single-scattering properties of ice crystals smaller than 50 micrometers using an exact method and approximation: Scattering database and application to in-situ forward scattering probes. *(Junshik Um)*

P.2 Antarctic region radar reflectivity-snowfall rate relationships from CloudSat observations and products *(Lisa Milani)*

P.3 Dual - Frequency Snow observations from CSU CHILL Radar and Nasa D3R radar *(V.C. Chandrasekar)*

P.4 Sensitivities of heterogenous scattering models as seen through DWR-Dm relationships *(George Duffy)*

P.5 Low-level sublimation snowfall due to katabatic winds on the margins of Antarctica *(Alexis Berne)*

P.6 Statistics of ice containing clouds at Ny-Alesund *(Tatiana Nomokonova)*

P.7 Use of coincident radar and radiometer observations from GPM, ATMS, and CloudSat for global spaceborne snowfall observation assessment *(Giulia Panegrossi)*

P.8 Linking snow bi-directional reflectance to snow microstructure *(Marie Dumont)*

P.9 Theoretical Modeling of Snow Water Equivalent Using Coherent Reflection from Satellite Signals of Opportunity *(Xiaolan Xu)*

P.10 Single scattering computations at the University of Ferrara Group (1995-2005) *(Franco Prodi)*

P.11 First results of the TRIple-frequency and Polarimetric radar Experiment for improving process observation of winter precipitation (TRIPEx campaign) *(José Dias Neto)*

P.12 How to constrain snow particle models? A first approach using triple-frequency radar Doppler spectra *(Stefan Kneifel)*

P.13 Challenges and opportunities in using a combination of in situ and multi-frequency radar observations of snowfall for evaluation of snow particle models *(Dmitri Moisseev)*

P.14 Closure study of microphysical and scattering properties of snowfall using data from the ARM BAECC campaign in Hyytiälä Finland (*Davide Ori*)

P.15 Impact of DDA-based Snow Phase Matrix on 3-D Microwave RT Model (*Kun Zhang*)

P.16 Using cloud radar Doppler spectra to identify microphysical growth processes: a BAECC-SNEX riming case study (*Heike Kalesse*)

P.17 Consistent X/Ka/W -band Ze-S relations derived from ground-based precipitation sensor and multi-frequency radar observations of snowfall (*Marta Tecla Falconi*)

List of Participants

First Name	Surname	Affiliation	Country
Ian	Adams	NASA Goddard Space Flight Center	USA
Alexis	Berne	EPFL-LTE	Switzerland
Paloma	Borque	University of Illinois	USA
V. Chandra	Chandrasekar	Colorado State University	USA
Eugene	Clothiaux	The Pennsylvania State University	USA
José	Dias Neto	University of Cologne	Germany
George	Duffy	Vanderbilt Universiry	USA
Marie	Dumont	CNRM/CEN, Météo-France	France
Robin	Ekelund	Chalmers University of Technology	Sweden
Patrick	Eriksson	Chalmers University of Technology	Sweden
Florian	Ewald	German Aerospace Center (DLR)	Germany
Marta Tecla	Falconi	University of Rome	Italy
Ines	Fenni	Jet Propulsion Laboratory	USA
Tim	Garrett	University of Utah	USA
Alan	Geer	ECMWF	United Kingdom
Josué	Gehring	EPFL-LTE	Switzerland
Rosa	Gierens	University of Cologne	Germany
Ryan	Honeyager	Florida State University	USA
Brandon	Hickman	University of Bonn	Germany
Marek	Jacob	University of Cologne	Germany
Heike	Kalesse	Institute for Tropospheric Research TROPOS	Germany
Stefan	Kneifel	University of Cologne	Germany
Kwo-Sen	Kuo	NASA GSFC/ESSIC, University of Maryland	USA
Matthew	Lammers	KBRwyle/NASA Goddard Space Flight Center	USA
Jussi	Leinonen	UCLA / NASA-JPL	USA
Anna Cinzia	Marra	ISAC-CNR	Italy
Vinia	Mattioli	EUMETSAT	Germany
Karina	McCusker	University of Reading	United Kingdom
Lisa	Milani	ISAC-CNR	Italy
Dmitri	Moisseev	University of Helsinki	Finland
Stephen	Munchak	NASA Goddard Space Flight Center	USA
Alexander	Myagkov	Radiometer Physics GmbH (RPG)	Germany
Tatiana	Nomokonova	University of Cologne	Germany
Davide	Ori	University of Cologne	Germany
Giulia	Panegrossi	CNR-ISAC	Italy
Christophe	Praz	EPFL-LTE	Switzerland
Franco	Prodi	ISAC-CNR	Italy
Jean F.	Rysman	ISAC-CNR	Italy
Paolo	Sanò	ISAC-CNR	Italy
Frederic	Tridon	University of Leicester	United Kingdom
Silke	Trömel	Meteorological Institute, University Bonn	Germany
Jani	Tyynelä	Finnish Meteorological Institute	Finland
Junshik	Um	University of Illinois at Urbana-Champaign	USA
Chris	Westbrook	University of Reading	United Kingdom
Norman	Wood	University of Wisconsin-Madison, SSEC	USA
Xiaolan	Xu	Jet Propulsion Laboratory, JPL	USA
Kun	Zhang	University of Colorado at Boulder	USA