List of Publications

A: Peer-reviewed Articles

Under Review

Seifert, A., F. Jakub, C. Siewert, L. von Terzi, and **S. Kneifel**: On the geometry of aggregated snowflakes. Submitted to *Tellus*

Ockenfuß, P., G. Köcher, M. Bauer-Pfundstein, and **S. Kneifel**: A Novel Framework for Automatic Scanning Radar Pointing Calibration Using the Sun. Submitted to *Atmos. Meas. Tech.*

Ockenfuß, P., M. Frech, M. Gergely, and **S. Kneifel**: First Nationwide Analysis of Riming Using Vertical Observations from the Operational German C-Band Radar Network. Submitted to *Atmos. Meas. Tech.*

von Terzi, L., D. Ori, and **S. Kneifel**: A Microwave Scattering Database of Oriented Ice and Snow Particles: Supporting Habit-Dependent Growth Models and Radar Applications (McRadar 1.0.0). Submitted to *Geosci. Model Dev.*

Gergely, M., P. Ockenfuß, F. Seeger, **S. Kneifel**, and M. Frech: Retrieval of the hail size distribution and vertical air motion from weather radar Doppler spectra. Submitted to *J. Atmos. Oceanic Tech.*

2025

1. Frech, M., **S. Kneifel**, P. Ockenfuß, and M. Gergely: Untapped opportunities of using vertically pointing precipitation observations from conventional weather radars for research applications and forecast products. *Bull. Amer. Meteor. Soc.*, BAMS-D-24-0113.1, https://doi.org/10.1175/BAMS-D-24-0113.1, in press.

2. Ockenfuß, P., M. Gergely, M. Frech, and **S. Kneifel**: Spatial and temporal scales of riming events in nonconvective clouds derived from long-term cloud radar observations in Germany. *J. Geophys. Res.*: Atmos., 130, e2024JD042180. https://doi.org/10.1029/2024JD042180.

2024

3. Chellini, G. and **S. Kneifel**: Turbulence as a key driver of ice aggregation and riming in Arctic low-level mixed-phase clouds, revealed by long-term cloud radar observations. *Geophys. Res. Lett.,* 51, e2023GL106599. https://doi.org/10.1029/2023GL106599.

2023

4. Chellini, G., R. Gierens, K. Ebell, T. Kiszler, P. Krobot, A. Myagkov, V. Schemann, and **S. Kneifel**: Low-level mixed-phase clouds at the high Arctic site of Ny-Ålesund: A comprehensive long-term dataset of remote sensing observations, *Earth Syst. Sci. Data*, 15, 5427–5448, https://doi.org/10.5194/essd-15-5427-2023.

5. Maherndl, N., M. Maahn, F. Tridon, J. Leinonen, D. Ori, and **S. Kneifel**: A riming-dependent parameterization of scattering by snowflakes using the self-similar Rayleigh-Gans approximation, *Q. J. Roy. Meteor. Soc.*, 149(757), 3562–3581, https://doi.org/10.1002/qj.4573.

2022

6. von Terzi, L., J. Dias Neto, D. Ori, A. Myagkov, and **S. Kneifel**, 2022: Ice microphysical processes in the dendritic growth layer: A statistical analysis combining multi-frequency and polarimetric Doppler cloud radar observations, *Atmos. Chem. Phys.*, 22, 11795–11821, https://doi.org/10.5194/acp-2022-263.

7. Tridon, F., I. Silber, A. Battaglia, **S. Kneifel**, A. Fridlind, P. Kalogeras, and R. Dhillon, 2022: Highly supercooled riming and unusual triple-frequency radar signatures over Antarctica, *Atmos. Chem. Phys.*, 22, 12467-12491, https://doi.org/10.5194/acp-2022-136.

8. Chellini, G., R. Gierens, and **S. Kneifel**, 2022: Ice aggregation in low-level mixed-phase clouds at a high Arctic site: Enhanced by dendritic growth and absent close to the melting level, *J. Geophys. Res.*: Atmos., 127, e2022JD036860. https://doi.org/10.1029/2022JD036860.

9. Karrer, M., J. Dias Neto, L. von Terzi, and **S. Kneifel**, 2022: Melting behavior of rimed and unrimed snowflakes investigated with statistics of Triple-frequency Doppler radar observations, *J. Geophys. Res.*: *Atmos.,* 127, e2021JD035907. https://doi.org/10.1029/2021JD035907.

10. Vogl, T., M. Maahn, **S. Kneifel**, W. Schimmel, D. Moisseev, and H. Kalesse-Los, 2022: Using artificial neural networks to predict riming from Doppler cloud radar observations, *Atmos. Meas. Tech.*, 15, 365-381, https://doi.org/10.5194/amt-15-365-2022.

11. **Kneifel, S.**, B. Pospichal, L. von Terzi, T. Zinner, M. Puh, M. Hagen, B. Mayer, U. Löhnert, and S. Crewell, 2022: Long-term cloud and precipitation statistics observed with remote sensors at the high-altitude Environmental Research Station Schneefernerhaus in the German Alps, *Meteorol. Z. (Contrib. Atm. Sci.)*, 31, 69-86 https://doi.org/10.1127/metz/2021/1099.

2021

12. Karrer, M., A. Seifert, D. Ori, and **S. Kneifel**, 2021: Improving the Representation of Aggregation in a Two-moment Microphysical Scheme with Statistics of Multi-frequency

Doppler Radar Observations, *Atmos. Chem. Phys.*, 21, 17133–17166, https://doi.org/10.5194/acp-21-17133-2021.

13. Trömel, S., Simmer, C., Blahak, U., Blanke, A., Ewald, F., Frech, M., Gergely, M., Hagen, M., Hörnig, S., Janjic, T., Kalesse-Los, H., **Kneifel, S.**, Knote, C., Mendrok, J., Moser, M., Möller, G., Mühlbauer, K., Myagkov, A., Pejcic, V., Seifert, P., Shrestha, P., Teisseire, A., von Terzi, L., Tetoni, E., Vogl, T., Voigt, C., Zeng, Y., Zinner, T., and Quaas, J., 2021: Overview: Fusion of Radar Polarimetry and Numerical Atmospheric Modelling Towards an Improved Understanding of Cloud and Precipitation Processes, *Atmos. Chem. Phys.*, 21, 17291-17314, https://doi.org/10.5194/acp-21-17291-2021.

14. Ori, D., L. von Terzi, M. Karrer, and **S. Kneifel**, 2021: snowScatt 1.0: Consistent model of microphysical and scattering properties of rimed and unrimed snowflakes based on the self-similar Rayleigh-Gans Approximation, *Geosci. Model Dev.*, 14, 1511-1531, https://doi.org/10.5194/gmd-14-1511-2021.

15. Kulie, M. S., C. Pettersen, A. J. Merrelli, T. J. Wagner, N. B. Wood, M. Dutter, D. Beachler, T. Kluber, R. Turner, M. Mateling, J. Lenters, P. Blanken, M. Maahn, C. Spence, **S. Kneifel**, P. A. Kucera, A. Tokay, L. F. Bliven, D. B. Wolff, and W. A. Petersen, 2021: Snowfall in the Northern Great Lakes: Lessons Learned from a Multi-Sensor Observatory, *Bull. Amer. Meteor. Soc.*, 102, E1317-E1339, https://doi.org/10.1175/BAMS-D-19-0128.1.

16. Mróz, K., A. Battaglia, **S. Kneifel**, L. von Terzi, M. Karrer, and D. Ori, 2021: Linking rain into ice microphysics across the melting layer in stratiform rain: a closure study., *Atmos. Meas. Tech.*, 14, 511-529, https://doi.org/10.5194/amt-14-511-2021.

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17. Gong, J., X. Zeng, D. Wu, S. J. Munchak, X. Li, **S. Kneifel**, D. Ori, L. Liao, and D. Barahona, 2020: Linkage among Ice Crystal Microphysics, Mesoscale Dynamics and Cloud and Precipitation Structures Revealed by Collocated Microwave Radiometer and Multi-frequency Radar Observations, *Atmos. Chem. Phys.*, 20, 12633-12653, https://doi.org/10.5194/acp-20-12633-2020.

18. Myagkov, A., **S. Kneifel**, and T. Rose, 2020: Evaluation of the reflectivity calibration of W-band radars based on observations in rain. *Atmos. Meas. Tech.*, 13, 5799-5825, https://doi.org/10.5194/amt-13-5799-2020.

19. **Kneifel, S.**, and D. Moisseev, 2020: Long-term statistics of riming in non-convective clouds derived from ground-based Doppler cloud radar observations, *J. Atmos. Sci.*, 77, 3495-3508, https://doi.org/10.1175/JAS-D-20-0007.1.

20. Tridon, F., A. Battaglia, and **S. Kneifel**, 2020: How to estimate total differential attenuation due to hydrometeors with ground-based multi-frequency radars?, *Atmos. Meas. Tech.*, 13, 5065-5085, https://doi.org/10.5194/amt-13-5065-2020.

21. Ori, D., V. Schemann, M. Karrer, J. Dias Neto, L. von Terzi, A. Seifert, and **S. Kneifel**, 2020: Evaluation of ice particle growth in ICON using statistics of multi-frequency Doppler cloud radar observations, *Q. J. Roy. Meteor. Soc.,* 146, 3830-384,9 doi:10.1002/qj.3875.

22. Mech, M., M. Maahn, **S. Kneifel**, D. Ori, E. Orlandi, P. Kollias, V. Schemann, and S. Crewell, 2020: PAMTRA 1.0: A Passive and Active Microwave radiative TRAnsfer tool for simulating radiometer and radar measurements of the cloudy atmosphere, *Geosci. Model Dev.*, 13, 4229-4251, https://doi.org/10.5194/gmd-13-4229-2020.

23. Karrer, M., A. Seifert, C. Siewert, D. Ori, A. von Lerber, and **S. Kneifel**, 2020: Ice Particle Properties Inferred from Aggregation Modelling, *Journal of Advances in Modeling Earth System*, 12, e2020MS002066. https://doi.org/10.1029/2020MS002066.

24. Mróz, K., A. Battaglia, **S. Kneifel**, L. P. D'Adderio, and J. Dias Neto, 2020: Triple-frequency Doppler retrieval of characteristic raindrop size, *Earth and Space Science*, 7, e2019EA000789. https://doi.org/10.1029/2019EA000789.

25. Gierens, R., **S. Kneifel**, M. D. Shupe, K. Ebell, M. Maturilli, and U. Löhnert, 2020: Low-level mixed-phase clouds in a complex Arctic environment, *Atmos. Chem. Phys.*, 20, 3459–3481, https://doi.org/10.5194/acp-20-3459-2020.

26. Lubin, D., D. Zhang, I. Silber, R.C. Scott, P. Kalogeras, A. Battaglia, D.H. Bromwich, M. Cadeddu, E. Eloranta, A. Fridlind, A. Frossard, K.M. Hines, **S. Kneifel**, W.R. Leaitch, W. Lin, J. Nicolas, H. Powers, P.K. Quinn, P. Rowe, L.M. Russell, S. Sharma, J. Verlinde, and A.M. Vogelmann, 2020: AWARE: The Atmospheric Radiation Measurement (ARM) West Antarctic Radiation Experiment, *Bull. Amer. Meteor. Soc.*, 101, E1069-E1091, doi:10.1175/BAMS-D-18-0278.1.

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27. Mason, S. L., R. J. Hogan, C. D. Westbrook, **S. Kneifel**, D. Moisseev, and L. von Terzi, 2019: The importance of particle size distribution and internal structure for triple-frequency radar retrievals of the morphology of snow, *Atmos. Meas. Tech.*, 12, 4993–5018, https://doi.org/10.5194/amt-12-4993-2019.

28. Dexheimer, D., M. Airey, E. Roesler, C. Longbottom, K. Nicoll, **S. Kneifel**, F. Mei, G. R. Harrison, G. Marlton, and P. Williams, 2019: Evaluation of ARM Tethered Balloon System instrumentation for supercooled liquid water and distributed temperature sensing in mixed-phase Arctic clouds, *Atmos. Meas. Tech.*, 12, 6845–6864, https://doi.org/10.5194/amt-12-6845-2019.

29. Tridon, F., A. Battaglia, R. J. Chase, F. J. Turk, J. Leinonen, **S. Kneifel**, K. Mroz, J. Finlon, A. Bansemer, S. Tanelli, A. J. Heymsfield, S. W. Nesbitt, 2019: The microphysics of stratiform precipitation during OLYMPEx: compatibility between 3-frequency radar and airborne in situ observations, *J. Geophys. Res.*, 124, 8764-8792. https://doi.org/10.1029/2018JD029858.

30. Seifert, A., J. Leinonen, C. Siewert, and **S. Kneifel**, 2019: The geometry of rimed aggregate snowflakes: A modeling study, *Journal of Advances in Modeling Earth Systems*, 11, 712-31, doi.org/10.1029/2018MS001519

31. Dias Neto, J., **S. Kneifel**, D. Ori, S. Trömel, J. Handwerker, B. Bohn, K. Mühlbauer, M. Lenefer, and C. Simmer, 2019: The TRIple-frequency and Polarimetric radar Experiment for improving process observation of winter precipitation, *Earth Syst. Sci. Data*, 11, 845-863, doi.org/10.5194/essd-11-845-2019.

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32. Mason, S., C. Chiu, R. J. Hogan, D. Moisseev, and **S. Kneifel**, 2018: Retrievals of riming and snow particle density from vertically-pointing Doppler radars, *J. Geophys. Res.*, 123, 13, 807-13834, doi: 10.1029/2018JD028603.

33. Küchler, N., **S. Kneifel**, P. Kollias, and U. Löhnert, 2018: Revisiting liquid water content retrievals in warm stratified clouds: The modified Frisch, *Geophys. Res. Lett*., 45, 9323-9330, doi: 10.1029/2018GL079845

34. Ori, D., and **S. Kneifel**, 2018: Assessing the uncertainties of the Discrete Dipole Approximation in case of melting ice particles, *J. Quant. Spectrosc. Radiat. Transfer*, 217, 396-406, doi: 10.1016/j.jqsrt.2018.06.017.

35. **Kneifel, S.**, J. Dias Neto, D. Ori, D. Moisseev, J. Tyynelä, I. S. Adams, K-S. Kuo, R. Bennartz, A. Berne, E. E. Clothiaux, P. Eriksson, A. J. Geer, R. Honeyager, J. Leinonen, and C. D. Westbrook, 2018: The First International Summer Snowfall Workshop: Scattering properties of realistic frozen hydrometeors from simulations and observations, as well as defining a new standard for scattering databases, *Bull. Amer. Meteor. Soc.*, 99, ES55–ES58, doi: 10.1175/BAMS-D-17-0208.1.

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38. Souverijns, N., A. Gossart, S. Lhermitte, I. V. Gorodetskaya, **S. Kneifel**, M. Maahn, F. L. Bliven, and N. P. M. Van Lipzig, 2017: Estimating radar reflectivity - snowfall rate relationships and their uncertainties over Antarctica by combining disdrometer and radar observations. *Atmospheric Research*, 196, 211-223, doi:10.1016/j.atmosres.2017.06.001.

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B: Contributions to Books

Kneifel, S., J. Leinonen, J. Tyynelä, D. Ori, and A. Battaglia, 2020: Scattering of Hydrometeors. In V. Levizzani, C. Kidd, D. B. Kirschbaum, C. D. Kummerow, K. Nakamura, and F. J. Turk (Ed.), *Satellite Precipitation Measurement (Vol. 1)*, New York: Springer, ISBN: 978-3-030-24568-9.

Battaglia, A., S. Tanelli, F. Tridon, **S. Kneifel**, J. Leinonen, and P. Kollias, 2020: Triple-Frequency Radar Retrievals. . In V. Levizzani, C. Kidd, D. B. Kirschbaum, C. D. Kummerow, K. Nakamura, and F. J. Turk (Ed.), *Satellite Precipitation Measurement (Vol. 1)*, New York: Springer, ISBN: 978-3-030-24568-9.

C: Conference Proceedings, Extended Abstracts, Technical Reports

Conference Proceedings (peer-reviewed)

Kneifel, S., S. Crewell, S. Redl, S. Steinke, C. Ohlwein, J. Keller, P. Friederichs, A. Hense, C. Wosnitza, and I. Pscheidt, 2012: Retrospective analysis of regional climate: The German reanalysis project - potential of remote sensing observations, *Proceedings of the International Geoscience and Remote Sensing Symposium*, July 22-27, 2012, Munich, Germany, 3689-3692, doi: 10.1109/IGARSS.2012.6350615.

Extended Abstracts

Maahn, M.,, P. Kollias, **S. Kneifel**, I. Gorodetskaya, G. Peters and C. Simmer: Measuring snow with a low-power K-band radar (Micro Rain Radar) at high latitudes. *European Radar Conference (ERAD)*, 25-29 June 2012, Toulouse, France, 5 pp.

Kneifel, S., U. Löhnert, L. Hirsch, A. Battaglia, S. Crewell, and D. Siebler: Ground-based remote sensing of snowfall through active and passive sensor synergy, *8th International Symposium on Tropospheric Profiling: Needs and Technologies (ISTP)*, 18-23 October, 2009, Delft, The Netherlands, 3 pp.

Technical Reports

Gorodetskaya, I., N. P. M. van Lipzig., M. R. van den Broeke, W. Boot, C. Reijmer, A. Mangold, **S. Kneifel**, S. Crewell, and J. Schween: Ground-based observations of cloud properties, precipitation and meteorological conditions at Princess Elisabeth station in Dronning Maud Land, Antarctica, *BPRC Technical Report 2010-01, 5th Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, The Ohio State University, Columbus, Ohio, USA, 12-14 July 2010.

Kneifel, S.: Comparison of humidity data from the ATOVS and SEVIRI system with ground-based radiosonde, microwave radiometer and GPS measurements. Final Report for the Satellite Application Facility on Climate Monitoring (CM SAF), Meteorological Institute, University of Munich, Germany, 25 November 2005.

D: Invited Talks

Ice microphysical processes inferred from single and multi-frequency radars, *University of Granada, Andalusian Institute for Earth System Research*, Granada, Spain, Oct. 2019.

How can ground-based active and passive multi-frequency microwave sensors help to improve retrievals of precipitating cold clouds?, *Jet Propulsion Laboratory (JPL), Earth Science Collaboration Center Colloquium*, Pasadena, USA, Dec. 2016.

Investigating snowfall and other cold hydrometeor properties with ground-based microwave remote sensors, *Pennsylvania State University, Meteorology Colloquium*, USA, Sept. 2015.

Snowfall microphysics observed with triple-frequency radars, *University of Reading, Meteorology Seminar*, Reading, UK, Mar. 2015.

How well do we understand mid- and low level cold clouds? New approaches using microwave remote sensors, *University of Reading, Lunchtime Seminar*, Reading, UK, Jan. 2014.

Verification of reanalysis data using a modular forward operator for active and passive microwave instruments, *Climate Monitoring – Satellite Application Facility (CM-SAF/DWD) Seminar*, Offenbach, Apr. 2013.

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E: Outreach

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