

## Dr. Daniel Kunkel

Contact address: Johannes Gutenberg-University - Institute for Atmospheric Physics  
Johann-Joachim Becherweg 21, D-55128 Mainz  
e-mail: dkunkel@uni-mainz.de, phone: +49 6131 - 39 22283, fax: +49 6131 - 39 23532

---

### EMPLOYMENT

- 12/2015 – Junior lecturer (“Habilitation”) at Institute for Atmospheric Physics, Johannes-Gutenberg University, Mainz, Germany. Main research topics: Tropopause dynamics, UTLS trace gas composition, transport processes from small to large scales, mesoscale and global Eulerian and Lagrangian modelling. Co-PI of the WISE mission 2017.
- 12/2012-11/2015 Post-doctoral researcher at Institute for Atmospheric Physics, Johannes-Gutenberg University, Mainz, Germany. Main research topic: Synoptic-scale wave breaking and its impact on the tropopause structure and cross tropopause transport
- 12/2008-11/2012 Research assistant at Department of Particle Chemistry / Department of Air Chemistry, Max-Planck Institute for Chemistry, Mainz, Germany  
Main research topic: Modeling of transport and deposition of trace species from urban agglomerations
- 06/2006-08/2008 Student assistant at Institute of Atmospheric Physics, Johannes Gutenberg-University and Max-Planck Institute for Chemistry, Mainz, Germany  
Main research: Participation in AMMA-SCOUT, Ouagadougou, Burkina Faso, analysis of in-situ measured ultrafine particles

### EDUCATION

- 01/2013 Dissertation in atmospheric physics (Dr. rer.-nat.)  
Thesis: *Global modeling of pollutant transport and deposition from anthropogenic source points on global scale (grade: magna cum laude)*
- 12/2008-11/2012 PhD candidate at Johannes Gutenberg-University and International Max-Planck-Research School (IMPRS)
- 10/2008 Diploma in Meteorology (Diplom-Meteorologe, MSc equivalent)  
Thesis: *Ultrafine Particles in the Upper Troposphere and Lower Stratosphere during the 2006 Monsoon Season over West Africa (grade: sehr gut)*
- 08/2007-02/2008 ERASMUS exchange student, studies of hydrology at Uppsala University, Uppsala Sweden
- 10/2003-10/2008 Studies of Atmospheric Sciences at Johannes Gutenberg-University, Mainz, Germany

### TEACHING

- WS 2018/2019 Lecture series “Einführung in die Meteorologie”
- WS 2017/2018 Lecture series “Einführung in die Meteorologie”
- SS 2017 Lecture series “Einführung in die Meteorologie”
- WS 2016/2017 Lecture on “HowTo Use Python, An Introductory Class”, An Introductory Course” for members of the Institute for Atmospheric Physics
- WS 2016/2017 Lecture on “HowTo Use LAGRANTO, An Introductory Course” for members of the Institute for Atmospheric Physics
- SS 2016 Lecture series “Einführung in die Meteorologie”

WS 2015/2016 - SS2013	Individual lectures in "Einführung in die Meteorologie I & II", lecture of Peter Hoor
WS 2009/2010	Teaching assistant "Einführung in die Meteorologie", lecture of Mark Lawrence
SS 2009	Teaching assistant "Einführung in die Meteorologie", lecture of Manfred Wendisch

## PUBLICATION LIST (peer-reviewed)

1. Abbatt, J. P. D., Leaitch, W. R., Aliabadi, A. A., Bertram, A. K., Blanchet, J.-P., Boivin-Rioux, A., Bozem, H., Burkart, J., Chang, R. Y. W., Charette, J., Chaubey, J. P., Christensen, R. J., Cirisan, A., Collins, D. B., Croft, B., Dionne, J., Evans, G. J., Fletcher, C. G., Galí, M., Ghahremaninezhad, R., Girard, E., Gong, W., Gosselin, M., Gourdal, M., Hanna, S. J., Hayashida, H., Herber, A. B., Hesaraki, S., Hoor, P., Huang, L., Husserr, R., Irish, V. E., Keita, S. A., Kodros, J. K., Köllner, F., Kolonjari, F., Kunkel, D., Ladino, L. A., Law, K., Lévassieur, M., Libois, Q., Liggio, J., Lizotte, M., Macdonald, K. M., Mahmood, R., Martin, R. V., Mason, R. H., Miller, L. A., Moravek, A., Mortenson, E., Mungall, E. L., Murphy, J. G., Namazi, M., Norman, A.-L., O'Neill, N. T., Pierce, J. R., Russell, L. M., Schneider, J., Schulz, H., Sharma, S., Si, M., Staebler, R. M., Steiner, N. S., Thomas, J. L., von Salzen, K., Wentzell, J. J. B., Willis, M. D., Wentworth, G. R., Xu, J.-W., and Yakobi-Hancock, J. D.: Overview paper: New insights into aerosol and climate in the Arctic, *Atmos. Chem. Phys.*, 19, 2527-2560, doi.org/10.5194/acp-19-2527-2019, 2019.
2. Si, M., Evoy, E., Yun, J., Xi, Y., Hanna, S. J., Chivulescu, A., Rawlings, K., Veber, D., Platt, A., Kunkel, D., Hoor, P., Sharma, S., Leaitch, W. R., and Bertram, A. K.: Concentrations, composition, and sources of ice-nucleating particles in the Canadian High Arctic during spring 2016, *Atmos. Chem. Phys.*, 19, 3007-3024, doi.org/10.5194/acp-19-3007-2019, 2019.
3. Schulz, H., Zanatta, M., Bozem, H., Leaitch, W. R., Herber, A. B., Burkart, J., Willis, M. D., Kunkel, D., Hoor, P. M., Abbatt, J. P. D., and Gerdes, R.: High Arctic aircraft measurements characterising black carbon vertical variability in spring and summer, *Atmos. Chem. Phys.*, 19, 2361-2384, doi.org/10.5194/acp-19-2361-2019, 2019.
4. Willis, M. D., Bozem, H., Kunkel, D., Lee, A. K. Y., Schulz, H., Burkart, J., Aliabadi, A. A., Herber, A. B., Leaitch, W. R., and Abbatt, J. P. D.: Aircraft-based measurements of High Arctic springtime aerosol show evidence for vertically varying sources, transport and composition, *Atmos. Chem. Phys.*, 19, 57-76, doi.org/10.5194/acp-19-57-2019, 2019.
5. Knudsen, E. M., Heinold, B., Dahlke, S., Bozem, H., Crewell, S., Gorodetskaya, I. V., Heygster, G., Kunkel, D., Maturilli, M., Mech, M., Viceto, C., Rinke, A., Schmithüsen, H., Ehrlich, A., Macke, A., Lüpkes, C., and Wendisch, M.: Meteorological conditions during the ALOUD/PASCAL field campaign near Svalbard in early summer 2017, *Atmos. Chem. Phys.*, 18, 17995-18022, doi.org/10.5194/acp-18-17995-2018, 2018.
6. Mungall, E. L., Abbatt, J. P. D., Wentzell, J. J. B., Wentworth, G. R., Murphy, J. G., Kunkel, D., Gute, E., Tarasick, D. W., Sharma, S., Cox, C. J., Uttal, T., and Liggio, J.: High gas-phase mixing ratios of formic and acetic acid in the High Arctic, *Atmos. Chem. Phys.*, 18, 10237-10254, doi.org/10.5194/acp-18-10237-2018, 2018.
7. Macdonald, K. M., Sharma, S., Toom, D., Chivulescu, A., Hanna, S., Bertram, A. K., Platt, A., Elsasser, M., Huang, L., Tarasick, D., Chellman, N., McConnell, J. R., Bozem, H., Kunkel, D., Lei, Y. D., Evans, G. J., and Abbatt, J. P. D.: Observations of atmospheric chemical deposition to high Arctic snow, *Atmos. Chem. Phys.*, 17, 5775-5788, doi:10.5194/acp-17-5775-2017, 2017.
8. Berkes, F., Hoor, P., Bozem, H., Kunkel, D., Sprenger, M., and Henne, S.: Airborne observation of mixing across the entrainment zone during PARADE 2011, *Atmos. Chem. Phys.*, 16, 6011-6025, doi:10.5194/acp-16-6011-2016, 2016.
9. Kunkel, D., Hoor, P., and Wirth, V.: The tropopause inversion layer in baroclinic life cycles experiments: the role of diabatic processes, *Atmos. Chem. Phys.*, 16, 541-560, doi:10.5194/acp-16-541-2016, 2016.

10. Kristiansen, N. I., Stohl, A., Olivie, D. J. L., Croft, B., Sovde, O. A., Klein, H., Christoudias, T., Kunkel, D., et al.: Evaluation of observed and modelled aerosol lifetimes using radioactive tracers of opportunity and an ensemble of 19 global models, *Atmos. Chem. Phys.*, 16, 3525-3561, doi:10.5194/acp-16-3525-2016, 2016.
11. Frey, W., Schofield, R., Hoor, P., Kunkel, D., et al.: The impact of overshooting deep convection on local transport and mixing in the tropical upper troposphere/lower stratosphere (UTLS), *Atmos. Chem. Phys.*, 15, 6467-6486, doi:10.5194/acp-15-6467-2015, 2015.
12. Kunkel, D., Hoor, P., Wirth, V.: Can inertia-gravity waves persistently alter the tropopause inversion layer, *Geoph. Res. Lett.*, 41, 7822-7829, doi:10.1002/2014GL061970, 2014.
13. Kunkel, D., Tost, H., and Lawrence, M. G.: Aerosol pollution potential from major population centers, *Atmos. Chem. Phys.*, 13, 4203-4222, doi:10.5194/acp-13-4203-2013, 2013.
14. Lelieveld, J., Lawrence, M. G., and Kunkel, D.: Comment on "Global risk of radioactive fallout after major nuclear reactor accidents" by Lelieveld et al. (2012), *Atmos. Chem. Phys.*, 13, 31-34, doi:10.5194/acp-13-31-2013, 2013.
15. Lelieveld, J., Kunkel, D., and Lawrence, M. G.: Global risk of radioactive fallout after major nuclear reactor accidents, *Atmos. Chem. Phys.*, 12, 4245-4258, doi:10.5194/acp-12-4245-2012, 2012.
16. Kunkel, D., M. G. Lawrence, H. Tost, A. Kerckweg, P. Jöckel, and S. Borrmann: Urban emission hot spots as sources for remote aerosol deposition, *Geophys. Res. Lett.*, 39, L01808, doi:10.1029/2011GL049634, 2012
17. Weigel, R., Borrmann, S., Kazil, J., Minikin, A., Stohl, A., Wilson, J. C., Reeves, J. M., Kunkel, D., et al.: In situ observations of new particle formation in the tropical upper troposphere: the role of clouds and the nucleation mechanism, *Atmos. Chem. Phys.*, 11, 9983-10010, doi:10.5194/acp-11-9983-2011, 2011.
18. Frey, W., Borrmann, S., Kunkel, D., Weigel, R., de Reus, M., Schlager, H., Roiger, A., Voigt, C., Hoor, P., Curtius, J., Krämer, M., Schiller, C., Volk, C. M., Homan, C. D., Fierli, F., Di Donfrancesco, G., Ulanovsky, A., Ravegnani, F., Sitnikov, N. M., Viciani, S., D'Amato, F., Shur, G. N., Belyaev, G. V., Law, K. S., and Cairo, F.: In situ measurements of tropical cloud properties in the West African Monsoon: upper tropospheric ice clouds, Mesoscale Convective System outflow, and subvisual cirrus, *Atmos. Chem. Phys.*, 11, 5569-5590, doi:10.5194/acp-11-5569-2011, 2011.
19. Real, E., Orlandi, E., Law, K. S., Fierli, F., Josset, D., Cairo, F., Schlager, H., Borrmann, S., Kunkel, D., Volk, C. M., McQuaid, J. B., Stewart, D. J., Lee, J., Lewis, A. C., Hopkins, J. R., Ravegnani, F., Ulanovski, A., and Liousse, C.: Cross-hemispheric transport of central African biomass burning pollutants: implications for downwind ozone production, *Atmos. Chem. Phys.*, 10, 3027-3046, doi:10.5194/acp-10-3027-2010, 2010.
20. Borrmann, S., Kunkel, D., et al.: Aerosols in the tropical and subtropical UT/LS: in-situ measurements of submicron particle abundance and volatility, *Atmos. Chem. Phys.*, 10, 5573-5592, doi:10.5194/acp-10-5573-2010, 2010.
21. Law, K. S., Fierli, F., Cairo, F., Schlager, H., Borrmann, S., Streibel, M., Real, E., Kunkel, D., et al.: Air mass origins influencing TTL chemical composition over West Africa during 2006 summer monsoon, *Atmos. Chem. Phys.*, 10, 10753-10770, doi:10.5194/acp-10-10753-2010, 2010.
22. de Reus, M., Borrmann, S., Bansemer, A., Heymsfield, A. J., Weigel, R., Schiller, C., Mitev, V., Frey, W., Kunkel, D., Kürten, A., Curtius, J., Sitnikov, N. M., Ulanovsky, A., and Ravegnani, F.: Evidence for ice particles in the tropical stratosphere from in-situ measurements, *Atmos. Chem. Phys.*, 9, 6775-6792, doi:10.5194/acp-9-6775-2009, 2009.

## **CONFERENCE CONTRIBUTIONS (only presenting)**

1. Kaluza, T., Hoor, P., Kunkel, D.: The tropopause inversion layer in baroclinic life cycles over the North Atlantic: a pre-WISE case study and climatology, EGU2017-9884, Vienna, 2017.

2. Kunkel., D., Kaluza, T., Wirth, V., Hoor, P.: A potential relation between stratosphere-troposphere exchange and the tropopause inversion layer in idealized baroclinic life cycle experiments, EGU2017-16635-1, Vienna, 2017.
3. Kunkel., D., Hoor.P: The tropopause inversion layer in the mid-latitudes: from idealized model experiments to measurements over the North Atlantic, First HALO Symposium, Oberpfaffenhofen, 2017.
4. Kunkel., D., Hoor.P, Wirth, V.: The tropopause inversion layer at midlatitudes: Formation processes and relation to stratosphere-troposphere exchange, AGU Fall Meeting, San Francisco, 2016.
5. Kunkel, D., Hoor, P., Mueller, S., Lachnitt, H.-C., Kluschat, B., Hofmann, C., Krause, J.: Wave induced mixing - airborne trace gas measurements with UMAQS, First GW-LCYCLE Science Meeting, DLR Oberpfaffenhofen, 2016.
6. Kunkel, D., Bozem H., Gutmann, R., and Hoor.P: How can the polar dome be identified in meteorological analysis data?, EGU2016-16880, EGU, Vienna, 2016.
7. Kunkel, D., Hoor, P., and Wirth, V.: Impact of diabatic processes on the tropopause inversion layer formation in baroclinic life cycles, EGU2015-8466, EGU, Vienna, 2015.
8. Kunkel, D., Hoor, P., and Wirth, V.: Diabatic and mixing processes and the tropopause inversion layer in baroclinic life cycle experiments, IUGG, Prague, 2015.
9. Kunkel, D., Wirth, V. and Hoor, P.: Can inertia-gravity waves persistently alter the tropopause inversion layer, IUGG, Prague, 2015.
10. Kunkel, D., Hoor, P., and Wirth, V.: Tropopause inversion layer and stratosphere-troposphere exchange in baroclinic life cycles: the role of diabatic processes, AGU fall meeting, San Francisco, 2014.
11. Kunkel, D., Wirth V., Hoor, P.: Tropopause inversion layer and stratosphere-troposphere exchange in the extratropical UTLS, 4th EMAC symposium, Berlin, 2014.
12. Kunkel, D., Wirth, V. and Hoor, P.: Tropopause inversion layer formation and stratosphere-troposphere exchange during idealized baroclinic wave life cycle experiments, EGU2014-9724, EGU, Vienna, 2014.
13. Kunkel, D., Wirth, V. and Hoor, P.: Tropopause inversion layer formation and stratosphere-troposphere exchange during idealized baroclinic wave life cycle experiments, COSMO User Meeting, Offenbach, 2014.
14. Kunkel, D., Wirth, V. and Hoor, P.: The Tropopause Inversion Layer in Baroclinic Lifecycle Experiments, WISE meeting, Mainz, 2014.
15. Kunkel, D., Tost, H., and Lawrence, M. G.: Impact of anthropogenic emissions from major population centers on global and regional aerosol budgets, 3rd EMAC symposium, Karlsruhe, 2013.
16. Kunkel, D., Tost, H., and Lawrence, M. G.: Impact of anthropogenic emissions from major population centers on global and regional aerosol budgets, EGU2013-7083, EGU, Vienna, 2013.
17. Kunkel, D., Lelieveld, J., and Lawrence, M. G.: Global risk of radioactive fallout after nuclear reactor accidents, EGU2012-7065, EGU, Vienna, 2012.
18. Kunkel, D., Lawrence, M. G., Tost, H., Kerkweg, A., Jöckel, P., and Borrmann, S.: Urban emission hot-spots as sources for remote aerosol deposition, EGU2012-7038, EGU, Vienna, 2012.
19. Kunkel, D., Lelieveld, J. and Lawrence, M. G.: Risk of radioactive exposure after nuclear power plant accident, Workshop on Severe Atmospheric Aerosol Events, KlimaCampus, Hamburg, 2011.
20. Kunkel, D., Lawrence, M. G., Kerkweg, A, Tost, H., Jöckel, P., and Borrmann S.: Transport and deposition characteristics of aerosol from urban point sources, 12th Symposium of the International Commission on Atmospheric Chemistry and Global Pollution (CACGP) and 11th Science Conference of the International Global Atmosphere Chemistry (IGAC) Project Halifax, Canada, 2010.
21. Kunkel, D., Lawrence, M. G., Kerkweg, A., Tost, H., Jöckel, P., and Borrmann S.: Transport characteristics of aerosol from urban point sources, EGU2010-2594, EGU, Vienna, 2010.

22. Kunkel, D., Lawrence, M. G., Kerckweg, A., Tost, H., Jöckel, P., and Borrmann S.: Aerosol pollution potential of major population centers, EGU2010-2595, EGU, Vienna, 2010.
23. Borrmann, S., Curtius, J., Kunkel, D., Weigel, R., Vicani, S., Schiller, C., Ulanovski, A., Ravegnani, F., Cairo, F., and Law, K. A.: Observations of ultrafine particle nucleation events in the tropical UT/LS over West Africa and Brazil, EGU2009-6415, EGU, Vienna. 2009.

## **PROFESSIONAL MEMBERSHIPS**

- since 2008      Deutsche Meteorologische Gesellschaft (German Meteorological Society)
- since 2009      European Geophysical Union (EGU)
- since 2016      American Meteorological Society (AMS)

## **EDITORIAL WORK**

- since 2012      Reviewer for Atmospheric Chemistry and Physics, Atmospheric Environment, Journal of Geophysical Research, Journal of the Atmospheric Sciences, Environmental Science and Technology, Atmospheric Research, Advances in Atmospheric Sciences, Earth and Space Science, Atmospheres
- since 2013      Co-Convenor of the session “Atmospheric transport of trace species and aerosols: Modeling and observations” at EGU General Assembly

## **RESEARCH GRANTS**

- 2018              Travel grant: LOTUS meeting, Geneva, Switzerland (WMO)
- 2017              Travel grant: OCTAV-UTLS meeting Boulder, USA (WMO)
- 2016              Funded project: Principle investigator of “MESO-TIL Impact of upper tropospheric jet-front systems on the mesoscale structure of the tropopause inversion layer and cross-tropopause transport” (DFG Schwerpunktprogramm HALO 1294, grant: 160.000 €)
- 2008              Research fellowship, FB08, Johannes Gutenberg-University