

# CURRICULUM VITAE

## Robert Wood

Assistant Professor  
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### Education:

- B.A.* University of Cambridge, UK, 1989-1992  
Natural Sciences (Physics and Theoretical Physics)
- Ph.D.* University of Manchester Institute of Science and Technology, UK, 1993-1997  
Atmospheric Physics, Title: *Aircraft Observations of Boundary Layer Structure*, Advisor  
Peter R Jonas

### Professional Experience

*Department of Atmospheric Sciences, University of Washington, Seattle (2006-present):*

**Assistant Professor:** Responsible for the development of a program of research centered on the understanding of cloud physical processes, and teaching in the undergraduate and graduate program.

*Department of Atmospheric Sciences, University of Washington, Seattle (2004-2006):*

**Research Assistant Professor:** Responsible for the development of a program of research centered on the understanding of cloud physical processes.

*Department of Atmospheric Sciences, University of Washington, Seattle (2001-2003):*

**Research Associate:** Studied boundary layer cloud structure, variability, and microphysical processes.

*Meteorological Research Flight, UK Met Office (1997-2001):*

**Research Scientist:** Research related to boundary layer cloud microphysical processes and structural properties. Responsibilities included the planning and executing of aircraft-based field programs.

### Honors

- The 2001 L. F. Richardson Prize, Royal Meteorological Society.
- Editors' Citation for Excellence in Refereeing for *Journal of Geophysical Research – Atmospheres*, 2007.
- University of Washington Department of Atmospheric Sciences Teaching Award

### Professional Activities

- Editor, *Journal of Climate*
- Reviewer for *Journal of the Atmospheric Sciences*, *Quarterly Journal of the Royal Meteorological Society*, *Journal of Climate*, *Journal of Geophysical Research*, *Atmospheric Research*, *Atmospheric Chemistry and Physics*, *Journal of Applied Meteorology*, *Journal of Atmospheric and Oceanic*

Technology, Atmospheric Chemistry and Physics, Transactions on Geoscience and Remote Sensing, Journal of Computational Physics, Geophysical Remote Sensing Letters.

- Member of American Meteorological Society, Royal Meteorological Society, American Geophysical Union
- American Meteorological Society STAC Atmospheric Radiation committee member
- VAMOS Ocean-Cloud-Atmosphere-Land Study (VOCALS) Scientific Working Group member
- Principal Investigator - VOCALS-Regional Experiment (VOCALS-REx), Chile, Oct/Nov 2008.
- Principal Investigator – ARM Mobile Facility Deployment - Clouds, Aerosols and Precipitation (CAP-MBL), Azores (March-December 2009)
- VAMOS Modeling Group member.
- Chairperson Elect, Gordon Conference on Radiation and Climate, 2011.
- NASA CloudSat/CALIPSO Mission Science Team Member.
- Physics of Stratocumulus Top (POST) Science Team Member.

### Publications

- [1] Wood, R., I. M. Stromberg, P. R. Jonas and C. S. Mill, 1997: Analysis of an air motion system on a light aircraft for boundary layer research. *J. Atmos. Oceanic Technol.*, **14**, 960-968.
- [2] Wood, R., D. W. Johnson and S. R. Osborne, 1998: The effect of drizzle on the redistribution of aerosol in the boundary layer: estimation of the scale of the effect during ACE-2 using aircraft data. *J. Aerosol Sci.*, **29**, Supp 1, 1097-1098.
- [3] Wood, R., I. M. Stromberg and P. R. Jonas, 1999: Aircraft observations of sea breeze frontal structure. *Quart. J. Roy. Meteor. Soc.*, **125**, 1959-1996.
- [4] Wood, R. and P. R. Field, 2000: Relationships between total water, condensed water and cloud fraction in stratiform clouds examined using aircraft data. *J. Atmos. Sci.*, **57**, 1888-1905.
- [5] Wood, R., D. W. Johnson, S. R. Osborne, M.O. Andreae, B. Bandy, T. S. Bates, C. O'Dowd, P. Glantz, K. Noone, P. K. Quinn, J. Rudolph, K. Suhre, 2000: Boundary layer and aerosol evolution during the third Lagrangian experiment of ACE-2. *Tellus*, **52B**, 401-422.
- [6] Osborne, S. R., D. W. Johnson, R. Wood, B. Bandy, M. O. Andreae, C. O'Dowd, P. Glantz, K. Noone, J. Rudolph, T. S. Bates P. K. Quinn, 2000: Evolution of the aerosol, cloud and boundary layer dynamic and thermodynamic characteristics during the second lagrangian experiment of ACE-2. *Tellus*, **52B**, 375-400.
- [7] Johnson D. W., S. R. Osborne, R. Wood, B. Bandy, M. O. Andreae, C. O'Dowd, P. Glantz, K. Noone, J. Rudolph, T. S. Bates P. K. Quinn, 2000: Observations of the evolution of the aerosol, cloud and boundary layer characteristics during the first Lagrangian experiment of ACE-2. *Tellus*, **52B**, 348-374.
- [8] Johnson D. W., S. R. Osborne, R. Wood, B. Bandy, M. O. Andreae, C. O'Dowd, P. Glantz, K. Noone, J. Rudolph, T. S. Bates P. K. Quinn, 2000: An overview of the Lagrangian experiments undertaken during the second Aerosol Characterisation Experiment. *Tellus*, **52B**, 290-320.
- [9] Solazzo, M., L. M. Russell, D. Percival, S. R. Osborne, R. Wood and D. Johnson, 2000: Entrainment rates during ACE-2 Lagrangian experiments calculated from aircraft measurements. *Tellus*, **52B**, 335-347.
- [10] Andreae, M. O., W. Elbert, R. Gabriel, D. W. Johnson, S. R. Osborne R. Wood, 2000: Soluble ion chemistry of the atmospheric aerosol and SO<sub>2</sub> concentrations over the eastern North Atlantic during ACE-2. *Tellus*, **52B**, 1066-1087.
- [11] Ghosh, S., P. R. Jonas and R. Wood, 2000: Large eddy simulations and aircraft observations of two cases of stratocumulus cloud. *Quart. J. Roy. Meteor. Soc.*, **126**, 2851-2872.
- [12] Wood, R., 2000: Parametrization of the effect of drizzle upon the droplet effective radius in stratocumulus clouds. *Quart. J. Roy. Meteorol. Soc.*, **126**, 3309-3325.

- [13] Suhre, K., D. W. Johnson, R. Rosset, S. R. Osborne, R. Wood, T. S. Bates, F. Raes, 2000: A continental outbreak of air that occurred during the Second Aerosol Characterization Experiment (ACE 2): A Lagrangian experiment. *J. Geophys. Res.*, **105**, 17911-17924.
- [14] Suhre, K., V. Crassier, C. Mari, R. Rosset, D. W. Johnson, S. R. Osborne, R. Wood, M. O. Andreae, B. Bandy, T. S. Bates, S. Businger, C. Gerbig, F. Raes and J. Rudolph, 2000, Chemistry and aerosols in the marine boundary layer: 1-D modelling of three ACE-2 Lagrangian experiments. *Atmos. Environ.*, **34**, 5079-5094.
- [15] Osborne, S. R., D. W. Johnson, K. N. Bower, R. Wood, 2001: Modification of the aerosol size distribution within exhaust plumes produced by diesel-powered ships. *J. Geophys. Res.*, **106**, 9827-9842.
- [16] Larson, V. E., R. Wood, P. R. Field, J.-C. Golaz, T. H. Vonder Haar, W. R. Cotton, 2001: Systematic biases in the microphysics and thermodynamics of numerical models that ignore subgrid-scale variability. *J. Atmos. Sci.*, **58**, 1117-1128.
- [17] Larson, V. E., R. Wood, P. R. Field, J.-C. Golaz, T. H. Vonder Haar, W. R. Cotton, 2001: Small-scale and mesoscale variability of scalars in cloudy boundary layers: One dimensional probability density functions. *J. Atmos. Sci.*, **58**, 1978-1994.
- [18] Wood, R. and J. P. Taylor, 2001: Liquid water path variability in unbroken marine stratocumulus cloud. *Quart. J. Roy. Meteorol. Soc.*, **127**, 2635-2662.
- [19] Wood, R., S. Irons, and P. R. Jonas, 2002: How important is the spectral ripening effect in stratiform boundary layer clouds? Studies using simple trajectory analysis. *J. Atmos. Sci.*, **59**, 2681-2693.
- [20] Price, J. D., and R. Wood, 2002: Comparison of probability density functions for total specific humidity and saturation deficit humidity, and consequences for cloud parameterization. *Quart. J. Roy. Meteorol. Soc.*, **128**, 2059-2072.
- [21] Wood, R., P. R. Field, and W. R. Cotton, 2002: Autoconversion rate bias in stratiform boundary layer cloud parameterizations. *Atmos. Res.*, **65**, 109-128.
- [22] Wood, R., C. S. Bretherton, and D. L. Hartmann, 2002: Diurnal cycle of liquid water path over the subtropical and tropical oceans. *Geophys. Res. Lett.* 10.1029/2002GL015371.
- [23] Field, P. R., R. Wood, E. Hirst, R. Greenaway, P. Kaye, P. R. A. Brown, and J. A. J. Smith, 2003: Ice particle interarrival times measured with a fast FSSP. *J. Atmos. Oceanic Technol.*, **20**, 249- 261, 2003.
- [24] Bretherton, C. S., T. Uttal, C. W. Fairall, S. E. Yuter, R. A. Weller, D. Baumgardner, K. Comstock, R. Wood, and G. B. Raga, 2004: The EPIC 2001 Stratocumulus Study, *Bull. Am. Meteorol. Soc.*, **85**, 967-977.
- [25] Wood, R., and Bretherton, C.S., 2004: Boundary layer depth, entrainment and decoupling in the cloud-capped subtropical and tropical marine boundary layer. *J. Clim.*, **17**, 3576-3588.
- [26] Comstock, K. K., R. Wood, S. E. Yuter, and C. S. Bretherton, 2004: Reflectivity and rain rate in and below drizzling stratocumulus. *Quart. J. Roy. Meteor. Soc.*, **128**, 2891-2918.
- [27] Stevens, B., G. Vali, K. Comstock, R. Wood, M. VanZanten, P.H. Austin, C.S. Bretherton, D.H. Lenschow, 2005: Pockets of Open Cells (POCs) and drizzle in marine stratocumulus, *Bull. Am. Meteorol. Soc.*, **86**, 51-57.
- [28] Wood, R., 2005: Drizzle in stratocumulus. Part I: Horizontal and vertical structure. *J. Atmos Sci.*, **62**, 3011-3034.
- [29] Wood, R., 2005: Drizzle in stratocumulus. Part II: Microphysical Aspects. *J. Atmos Sci.*, **62**, 3035-3050.
- [30] Wood, R., and P. Blossey, 2005: Comments on: "On the parameterization of the autoconversion process. Part I: Analytical formulation of the Kessler-type parameterizations". *J. Atmos. Sci.*, **62**, 3003-3006.
- [31] Caldwell, P., C. S. Bretherton, and R. Wood, 2005: Mixed layer budget analysis of stratocumulus dynamics during EPIC. *J. Atmos. Sci.*, **62**, 3775-3791.

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- [33] Wood, R., and D. L. Hartmann, 2006: Spatial variability of liquid water path in marine low cloud: The importance of mesoscale cellular convection. *J. Clim.*, **19**, 1748-1764.
- [34] Rasch, P. J., Stevens, M. J., Ricciardulli, L., Dai, A., Negri, A., Wood, R., Boville, B. A., Eaton, B., and Hack, J. J., 2006: A characterization of tropical transient activity in the CAM3 atmospheric hydrologic cycle., *J. Clim.*, **19**, 2222-2242.
- [35] Wood, R., and C. S. Bretherton, 2006: On the relationship between stratiform low cloud cover and lower tropospheric stability., *J. Clim.*, **19**, 6425-6432.
- [36] Wood, R., 2006: The rate of loss of cloud condensation nuclei by coalescence in warm clouds. *J. Geophys. Res.*, **111**, D21205, doi:10.1029/2006JD007553.
- [37] Field, P. R. and R. Wood, 2007: Precipitation and cloud structure in midlatitude cyclones. *J. Clim.*, **20**, 233-254.
- [38] Wood, R., 2007: Cancellation of aerosol indirect effects in marine stratocumulus through cloud thinning. *J. Atmos. Sci.*, **64**, 2657-2669.
- [39] Kubar, T. L., D. L. Hartmann, and R. Wood, 2007: Radiative and convective driving of tropical high clouds. *J. Clim.*, **20**, 5510-5526.
- [40] Comstock, K. K., S. E. Yuter, R. Wood, and C. S. Bretherton, 2007: The three dimensional structure and kinematics of drizzling stratocumulus. *Mon. Wea. Rev.*, **135**, 3767-3784.
- [41] Field, P. R. and R. Wood, 2007: Corrigendum to Precipitation and cloud structure in midlatitude cyclones. *J. Clim.*, **20**, 5208-5210.
- [42] Yuan, J., D. L. Hartmann, and R. Wood, 2007: Dynamic effects on tropical mean cloud radiative forcing and radiation budget. *J. Clim.*, **21**, 2337-2351, 2008.
- [43] Chen, R., R. Wood, Z. Li, R. Ferraro, and F-L Chang, 2008: Studying the vertical variation of cloud droplet effective radius using ship and spaceborne remote sensing data. *J. Geophys. Res.*, **113**, D00A02, doi:10.1029/2007JD009596.
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- [46] Field, P. R., A. Gettelman, R. Neale, R. Wood, P. J. Rasch and H. Morrison, 2008: Midlatitude cyclone compositing to constrain climate model behavior using satellite observations. *J. Clim.*, **21**, 5887-5903
- [47] Kay, J. E., and R. Wood, 2008: Timescale analysis of aerosol sensitivity during homogeneous freezing and implications for upper tropospheric water vapor budgets. *Geophys. Res. Lett.*, **35**, L10809, doi:10.1029/2007GL032628.
- [48] Brenguier, J.-L. and R. Wood, 2009: Observational strategies from the micro to meso scale. In the Strüngmann Forum Report, *Clouds in the Perturbed Climate System: Their Relationship to Energy Balance, Atmospheric Dynamics, and Precipitation*. Edited by Jost Heintzenberg and Robert J. Charlson. MIT Press ISBN 978-0-262-01287-4.
- [49] Quaas, J. (Rapporteur), S. Bony, W. D. Collins, L. Donner, A. Illingworth, A. Jones, U. Lohmann, M. Satoh, S. E. Schwartz, W-K. Tao, and R. Wood, 2009: Current understanding and quantification of clouds in the changing climate system and strategies for reducing critical uncertainties. In the Strüngmann Forum Report, *Clouds in the Perturbed Climate System: Their Relationship to Energy Balance, Atmospheric Dynamics, and Precipitation*. Edited by Jost Heintzenberg and Robert J. Charlson. MIT Press ISBN 978-0-262-01287-4

- [50] Chand, D., R. Wood, T. Anderson, S. K. Satheesh, and R. J. Charlson, 2009: Satellite-derived direct radiative effect of aerosols dependent on cloud cover. *Nature Geoscience*, **2**, 181-184.
- [51] Lopez, M. A., D. L. Hartmann, P. N. Blossey, R. Wood, C. S. Bretherton, and T. L. Kubar, 2009: A test of the simulation of tropical convective cloudiness by a cloud-resolving model. *J. Clim.* **22**, 2834-2849.

#### **Submitted or In-Press**

- [52] Wood, R. M. Kohler, R. Bennartz, C. O'Dell, 2008: The diurnal cycle of surface divergence over the global oceans. *Quart. J. Roy. Meteorol. Soc.*, in press.
- [53] Kubar, T., D. L. Hartmann, and R. Wood, 2009: Understanding the importance of microphysics and macrophysics for warm rain in marine low clouds: Part I. Satellite observations. *J. Atmos. Sci.*, in press.
- [54] Wood, R., T. Kubar, and D. L. Hartmann. Understanding the importance of microphysics and macrophysics for warm rain in marine low clouds: Part II. Heuristic models of rain formation. Submitted to *J. Atmos. Sci.*, in press.