

Susan C. van den Heever

Citation count - 3003

Education

- Ph.D. in Atmospheric Science – 2001 – Colorado State University
- M.S. in Geography – 1994 – University of the Witwatersrand, Johannesburg
- B.S. Hons – 1990 – University of the Witwatersrand, Johannesburg
- H. Dip. Education – 1989 – University of the Witwatersrand, Johannesburg
- B.S. in Mathematics – 1988 – University of the Witwatersrand, Johannesburg

Career Overview

- Professor, Dept. of Atmospheric Science, Colorado State University, 2017-current
- Associate Professor, Dept. of Atmospheric Science, Colorado State University, 2013-2017
- Assistant Professor, Dept. of Atmospheric Science, Colorado State University, 2008-2013
- Research Scientist, Dept. of Atmospheric Science, Colorado State University, 2004-2008
- Post-Doctoral Fellow, Dept. of Atmospheric Science, Colorado State University, 2002-2004
- High School Math Teacher, Wendywood High School, Johannesburg, 1991-1992

Research Interests

- Cloud physics
- Cloud dynamics
- Aerosol-cloud-precipitation interactions
- Deep convective storm processes
- Numerical modelling

Awards, Honors, and Positions

- Journal of the Atmospheric Sciences – Editor, 2017-present
- American Geophysical Union ASCENT award, 2016
- Monfort Professor, Colorado State University, 2015-2017
- Outstanding Professor of the Year Award, Department of Atmospheric Science, CSU, 2015
- Graduate Student Council Award for Graduate Advising and Mentorship, CSU, 2015
- Outstanding Professor of the Year Award, Department of Atmospheric Science, CSU, 2013
- George T. Abell Outstanding Early-Career Faculty Award, College of Engineering, CSU, 2012
- Outstanding Professor of the Year Award, Department of Atmospheric Science, CSU, 2013
- Quarterly Journal of the Royal Meteorological Review Award for 2008, Royal Meteorological Society, 2009
- NASA's Group Achievement Award to CRYSTAL-FACE Science Team, NASA, 2002
- South African Association of the Advancement of Science Award, SAAAS, 1995
- Chamber of Mines Gold Medal, University of Witwatersrand, Johannesburg, 1991
- Stanley P. Jackson Medal, University of Witwatersrand, Johannesburg, 1991

Publications

2018

1. Haddad, Z.S., and co-authors, 2018: Review of concepts for "distributed" satellite observations of cloud dynamics using microwave instruments. In review at *Terrestrial, Atmospheric and Oceanic Sciences*.
2. Sauter, K., T.S. L'Ecuyer, S.C. van den Heever, C. Twohy, A. Heidinger, S. Wanzong, and N. Wood, 2018: The observed influence of tropical convection on the Saharan dust layer. In review at *J. Geo. Res.*
3. Jensen, E.J., S.C. van den Heever, and L.D. Grant, 2018: The lifecycles of ice crystals detrained from the tops of deep convection. Accepted pending revision at *J. Geo. Res.*
4. Kalmus, P., B.H. Kahn, S.W. Freeman, and S.C. van den Heever, 2018: Trajectory-enhanced AIRS observations of environmental factors leading to tornadogenesis. Accepted pending revision at *Mon. Wea. Rev.*
5. Grant, L.D., and S.C. van den Heever, 2018: Cold pool - land surface interactions in a dry continental environment. In press at *JAMES* [\[PDF\]](#)
6. Grant, L.D., T.P. Lane, and S.C. van den Heever, 2018: The role of cold pools in tropical oceanic convective systems. In press at *J. Atmos Sci.* [\[PDF\]](#)
7. Naud, C.M., D.J. Posselt, and S.C. van den Heever, 2018: Reply to "Comments on 'A CloudSat-CALIPSO view of cloud and precipitation properties across cold fronts over the global oceans' ". *J. Clim.*, 31, 2969-2975. [\[PDF\]](#)
8. Igel, A.L., S.C. van den Heever, and J.S. Johnson, 2017: Meteorological and land surface properties impacting sea breeze extent and aerosol distribution in a dry environment. *J. Geo. Res.*, 123, 22-37. <https://doi.org/10.1002/2017JD027339>. [\[PDF\]](#)
9. Riley Dellaripa, E.M., E.D. Maloney, and S.C. van den Heever, 2017: Wind-flux feedbacks and convective organization during the November 2011 MJO event in a high-resolution model." *J. Atmos. Sci.*, 75, 57-84. [\[PDF\]](#)
10. Clavner, M., L.D. Grasso, W.R. Cotton, and S.C. van den Heever, 2018: The response of a simulated mesoscale convective system to increased aerosol pollution. Part II: Derecho characteristics and intensity in response to increased pollution. *Atmos. Res.* , 199, 209-223. [\[PDF\]](#)
11. Clavner, M., W.R. Cotton, S.C. van den Heever, J.R. Pierce and S.M. Saleeby, 2018: The response of a simulated mesoscale convective system to increased aerosol pollution. Part I: Precipitation intensity, distribution and efficiency. *Atmos. Res.* , 199, 193-208 [\[PDF\]](#)

2017

12. Marinescu, P.J., S.C. van den Heever, S.M. Saleeby, S.M. Kreidenweis, and P.J. DeMott, 2017: The microphysical roles of lower-tropospheric versus midtropospheric aerosol particles in mature-stage MCS precipitation. *J. Atmos. Sci.*, 74, 3657-3678. [\[PDF\]](#)
13. Naud, C.M., D.J. Posselt, and S.C. van den Heever, 2017: Observed covariations of aerosol optical depth and cloud cover in extratropical cyclones. *J. Geo. Res.*, 122, 10,338-10,356. [\[PDF\]](#)
14. Twohy, C.H., B.G. Anderson, R.A. Ferrare, K.E. Sauter, T.S. L'Ecuyer, S.C. van den Heever, A.J. Hemsfield, S. Ismail, and G.S. Diskin, 2017: Saharan dust, convective lofting, aerosol enhancement zones, and potential impacts on ice nucleation in the tropical upper troposphere. *J. Geo. Res.*, 122, 8833-8851. [\[PDF\]](#)
15. Stolz, D.C., S.A. Rutledge, J. R. Pierce and S.C. van den Heever, 2017: A global lightning parameterization based on statistical relationships between environmental factors, aerosols and convective clouds in the TRMM climatology. *J. Geo. Res.*, 122, 7461-7492. [\[PDF\]](#)
16. Igel, A.L., and S.C. van den Heever, 2017: The role of the gamma function shape parameter in determining differences between condensation rates in bin and bulk microphysics schemes. *Atmos. Chem. Phys.*, 17, 4599-4609. [\[PDF\]](#)
17. Drager, A.J., and S.C. van den Heever, 2017: Characterizing convective cold pools. *J. Adv. Model. Earth. Syst.*, 9, 1091-1115. [\[PDF\]](#)
18. Igel, A.L. and S.C. van den Heever, 2017: The importance of the shape of cloud droplet size distributions in shallow cumulus clouds. Part II: Bulk microphysics simulations. *J. Atmos. Sci.*, 74, 259-273. [\[PDF\]](#)
19. Igel, A.L. and S.C. van den Heever, 2017: The importance of the shape of cloud droplet size distributions in shallow cumulus clouds. Part I: Bin microphysics simulations. *J. Atmos. Sci.*, 74, 249-258. [\[PDF\]](#)

2016

20. Naud, C.M., D.J. Posselt, and S.C. van den Heever, 2016: Aerosol optical depth distribution in extratropical cyclones over the northern hemisphere oceans. *Geo. Res. Lett.* 43, 10,504-10,511. [\[PDF\]](#)
21. Herbener, S.R., S.M. Saleeby, S.C. van den Heever, and C.H. Twohy, 2016: Tropical storm redistribution of Saharan Dust to the Upper Troposphere and Ocean Surface. *Geo. Res. Lett.*, 43, 10,463-10,471. [\[PDF\]](#)
22. Saleeby, S.M., S.C. van den Heever, P.J. Marinescu, S.M. Kreidenweis, and P.J. DeMott, 2016: Aerosol indirect effects on the anvil characteristics of mesoscale convective systems. *J. Geo. Res.*, 121, 10,880-10,901. [\[PDF\]](#)
23. Marinescu, P.J., S.C. van den Heever, S.M. Saleeby and S.M. Kreidenweis, 2016: The microphysical contributions to and evolution of latent heating profiles in two MC3E MCSs. *J. Geo. Res.*, 121, 7913-7935. [\[PDF\]](#)

24. Nelson, E.L., T.S. L'Ecuyer, S.M. Saleeby, W. Berg, S.R. Herbener, and S.C. van den Heever, 2016: Toward an algorithm for estimating latent heat release in warm rain systems. *J. Atmos. Oceanic Technol.*, 33, 1309-1329. [\[PDF\]](#)
25. Grant, L.D., and S.C. van den Heever, 2016: Cold pool dissipation. *J. Geo. Res.*, 121, 1138-1155. [\[PDF\]](#)

2015

26. King, J.M., C.D. Kummerow, S.C. van den Heever, and M.R. Igel, 2015: Observed and Modeled Warm Rainfall Occurrence and Its Relationships with Cloud Macrophysical Properties. *J. Atmos. Sci.*, 72, 4075-4090. [\[PDF\]](#)
27. Sheffield, A.M., S.M. Saleeby, and S.C. van den Heever, 2015: Aerosol-induced mechanisms for cumulus congestus growth. *J. Geo. Res.*, 120, 8941-8952. [\[PDF\]](#)
28. Naud, C.D., D.J. Posselt, and S.C. van den Heever, 2015: A CloudSat-CALIPSO view of cloud and precipitation properties across cold fronts over the global oceans. *J. Clim.*, 28, 6743-6762. [\[PDF\]](#)
29. Igel, M.R., and S.C. van den Heever, 2015: The relative influence of environmental characteristics on tropical deep convective morphology as observed by CloudSat. *J. Geo. Res.*, 120, 4304-4322. [\[PDF\]](#)
30. Khain, A.P., K.D. Beheng, A. Heymsfield, A. Korolev, S.O. Krichak, Z. Levin, M. Pinsky, V. Phillips, T. Prabhakaran, A. Teller, S.C. van den Heever and J.-I. Yano, 2015: Representation of microphysical processes in cloud-resolving models: spectral (bin) microphysics vs bulk-parameterization. *Rev. of Geophysics*, 53, 247-322. [\[PDF\]](#)
31. Grant, L.D., and S.C. van den Heever, 2015: Cold pool and precipitation responses to aerosol loading: modulation by dry layers. *J. Atmos. Sci.*, 72, 1398-1408. [\[PDF\]](#)
32. Saleeby, S.M., S.R. Herbener, S.C. van den Heever, and T.S. L'Ecuyer, 2015: Impacts of cloud droplet-nucleating aerosols on shallow tropical convection. *J. Atmos. Sci.*, 72, 1369-1385. [\[PDF\]](#)
33. Igel, A.L., M.R. Igel, and S.C. van den Heever, 2015: Make it a double? Sobering results from simulations using single-moment microphysics schemes. *J. Atmos. Sci.*, 72, 910-925. [\[PDF\]](#)

2014

34. Igel, M.R., A.J. Drager, and S.C. van den Heever, 2014: A CloudSat cloud object partitioning technique and assessment and integration of deep convective anvil sensitivities to sea surface temperature. *JGR*, 119, 10515-10535. [\[PDF\]](#)
35. Grant, L.D., and S.C. van den Heever, 2014: Aerosol-cloud-land surface interactions within tropical sea breeze convection. *J. Geo. Res.*, 119, 8340-8361. [\[PDF\]](#)
36. Grant, L.D., and S.C. van den Heever, 2014: Microphysical and dynamical characteristics of low-precipitation and classic supercells. *J. Atmos. Sci.*, 71, 2604-2624. [\[PDF\]](#)

37. Herbener, S.R., S.C. van den Heever, G.G. Carrio, S.M. Saleeby, and W.R. Cotton, 2014: Aerosol indirect effects on idealized tropical cyclone dynamics. *J. Atmos. Sci.*, 71, 2040-2055. [\[PDF\]](#)
38. Storer, R.L., S.C. van den Heever, and T.S. L'Ecuyer, 2014: Observations of aerosol-induced convective invigoration in the tropical East Atlantic. *J. Geo. Res.*, 119, 3963-3975. [\[PDF\]](#)
39. Igel, M.R., S.C. van den Heever, G.L. Stephens, and D.J. Posselt, 2014: Convective-scale responses of a large-domain, modeled tropical environment to surface warming. *Q.J. Roy. Meteor. Sci.*, 140, 1333-1343. [\[PDF\]](#)
40. McGee, C.J. and S.C. van den Heever, 2014: Latent heating and mixing due to entrainment in tropical deep convection. *J. Atmos. Sci.*, 71, 816-832. [\[PDF\]](#)
41. Igel, A.L., and S.C. van den Heever, 2014: The role of latent heating in warm frontogenesis. *Q.J. Roy. Meteor. Sci.*, 140, 139-150. [\[PDF\]](#)

2013

42. Saleeby, S.M., and S.C. van den Heever, 2013: Developments in the CSU-RAMS Aerosol Model: Emissions, Nucleation, Regeneration, Deposition, and Radiation. *J. Appl. Meteor. Climatol.*, 52, 2601-2622. [\[PDF\]](#)
43. Naud, C.M., J.F. Booth, D.J. Posselt, and S.C. van den Heever, 2013: Multiple satellite observations of cloud cover in extratropical cyclones. *J. G. Res.*, 118, 9982-9996. [\[PDF\]](#)
44. Adams-Selin, R.D., S.C. van den Heever, and R.H. Johnson, 2013: Sensitivity of Bow-Echo Simulation to Microphysical Parameterizations. *Wx. and Forecasting*, 28, 1188-1209. [\[PDF\]](#)
45. Seigel, R.B., and S.C. van den Heever, 2013: Squall-line intensification via hydrometeor recirculation. *J. Atmos. Sci.*, 70, 2012-2031. [\[PDF\]](#)
46. Igel, A.L., S.C. van den Heever, C.M. Naud, S.M. Saleeby, and D.J. Posselt, 2013: Sensitivity of warm frontal processes to cloud-nucleating aerosol concentrations. *J. Atmos. Sci.*, 70, 1768-1783. [\[PDF\]](#)
47. Seigel, R.B., S.C. van den Heever, and S.M. Saleeby, 2013: Mineral dust indirect effects and cloud radiative feedbacks of a simulated idealized nocturnal squall line. *Atmos. Chem. Phys.*, 13, 4467-4485. [\[PDF\]](#)
48. Adams-Selin, R.D., S.C. van den Heever, and R.H. Johnson, 2013: Impact of graupel parameterization schemes on idealized bow echo simulations. *Mon. Wea. Rev.*, 141, 1241-1262. [\[PDF\]](#)
49. Storer, R.L., and S.C. van den Heever, 2013: Microphysical processes evident in aerosol forcing of tropical deep convective clouds. *J. Atmos. Sci.*, 70, 430-446. [\[PDF\]](#)

2012

50. Seigel, R.B., and S.C. van den Heever, 2012: Dust lofting and ingestion by supercell storms. *J. Atmos. Sci.*, 69, 1453-1473. [\[PDF\]](#)
51. Seigel, R.B., and S.C. van den Heever, 2012: Simulated density currents beneath embedded stratified layers. *J. Atmos. Sci.*, 69, 2192-2200. [\[PDF\]](#)
52. Naud, C.M., D.J. Posselt, and S.C. van den Heever, 2012: Observational analysis of cloud and precipitation in midlatitude cyclones: northern versus southern hemisphere warm fronts. *J. Clim.*, 25, 5135-5151. [\[PDF\]](#)
53. Posselt, D.J., S.C. van den Heever, G.L. Stephens, and M.R. Igel, 2012: Changes in the interaction between tropical convection, radiation and the large scale circulation in a warming environment. *J. Clim.*, 25, 557-571. [\[PDF\]](#)

2011

54. van den Heever, S.C., G.L. Stephens, and N.B. Wood, 2011: Aerosol indirect effects on tropical convection characteristics under conditions of radiative-convective equilibrium. *J. Atmos. Sci.*, 68, 699-718. [\[PDF\]](#)
55. Suzuki, K., G.L. Stephens, S.C. van den Heever, S.C., and T.Y. Nakajima, 2011: Diagnosis of the warm rain process in cloud-resolving models using joint CloudSat and MODIS observations. *J. Atmos. Sci.*, 68, 2655-2670. [\[PDF\]](#)

2010

56. Storer, R.L., S.C. van den Heever and G.L. Stephens, 2010: Modeling aerosol impacts on convective storms in different environments. *J. Atmos. Sci.*, 67, 3904-3915. [\[PDF\]](#)
57. Saleeby, S.M., S.C. W. Berg, S.C. van den Heever and T. LEcuyer, 2010: Impact of cloud-nucleating aerosols in cloud-resolving model simulations of warm-rain precipitation in the East China Sea. *J. Atmos. Sci.*, 67, 3916-3930. [\[PDF\]](#)

2009

58. Twohy, C.H., S.M. Kreidenweis, T. Eidhammer, E.V. Browell, A.J. Heymsfield, A.R. Bansemer, B.E. Anderson, G. Chen, S. Ismail, P.J. DeMott and S.C. van den Heever, 2009: Saharan dust particles nucleate droplets in Eastern Atlantic clouds. *Geophys. Res. Lett.*, 36, L01807, doi:10.1029/2008GL035846. [\[PDF\]](#)
59. Wang, J., S.C. van den Heever and J.S. Reid, 2009: A conceptual model for the link between Central American biomass burning aerosols and severe weather over the south central United States. *Environ. Res. Lett.*, 4, 015003, doi:10.1088/1748-9326/4/1/015003. [\[PDF\]](#)

2008

60. Stephens, G.L., S.C. van den Heever, and L. Pakula, 2008: Radiative-convective feedbacks in idealized states of radiative convective equilibrium. *J. Atmos. Sci.*, 65, 3899-3916. [\[PDF\]](#)

61. Posselt, D.J., S.C. van den Heever, and G.L. Stephens, 2008: Trimodal cloudiness and tropical stable layers in simulations of radiative convective equilibrium. *Geophys. Res. Lett.*, 35, L08802, doi:10.1029/2007GL033029. [\[PDF\]](#)
62. Berg, W., T. LEcuyer, and S.C. van den Heever, 2008: Evidence for the impact of aerosols on the onset and microphysical properties of rainfall from a combination of satellite observations and cloud-resolving model simulations. *J. Geophys. Res.*, 113, D14S23, doi:10.1029/2007JD009649. [\[PDF\]](#)

2007

63. van den Heever, S.C., and W.R. Cotton, 2007: Urban aerosol impacts on downwind convective storms. *J. Appl. Meteor. Climatol.*, 46, 828-850. [\[PDF\]](#) (Highlighted in BAMS: van den Heever, S.C., and W.R. Cotton, 2005: Modeling the impacts of urban aerosol on convection and precipitation in Conference Notebook. *Bull. Amer. Met. Soc.*, 86, 476).
64. Carrio, G.G., S.C. van den Heever, and W.R. Cotton, 2007: Impacts of nucleating aerosol on anvil-cirrus clouds: A modeling study. *Atmos. Res.*, 111-131. [\[PDF\]](#)

2006

65. van den Heever, S.C., G.G. Carrio, W.R. Cotton, P.J. DeMott, and A.J. Prenni, 2006: Impacts of nucleating aerosol on Florida storms. Part I: Mesoscale simulations. *J. Atmos. Sci.*, 63, 1752-1775. [\[PDF\]](#)

Pre-2005

66. van den Heever, S.C., and W.R. Cotton, 2004: The impact of hail size on simulated supercell storms. *J. Atmos. Sci.*, 61, 1596-1609. [\[PDF\]](#)
67. van den Heever, S.C., P.C. D'Abreton and P.D. Tyson, 1997: Numerical simulation of tropical-temperate troughs over southern Africa using the CSU RAMS model. *South African Journal of Science*, 93, 359-365.