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Qualifications

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Employment

University Lecturer

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Publications

Analytical and adaptable initial conditions for dry and moist baroclinic waves in the global hydrostatic model OpenIFS (CY43R3)

Bouvier, C. G. F., van den Broek, D., Ekblom, M. & Sinclair, V., 16 Apr 2024, In: Geoscientific Model Development. 17, 7, p. 2961–2986 26 p.

Oxidized organic molecules in the tropical free troposphere over Amazonia

Zha, Q., Aliaga, D., Krejci, R., Sinclair, V. A., Wu, C., Ciarelli, G., Scholz, W., Heikkinen, L., Partoll, E., Gramlich, Y., Huang, W., Leiminger, M., Enroth, J., Peräkylä, O., Cai, R., Chen, X., Koenig, A. M., Velarde, F., Moreno, I., Petäjä, T., & 9 others Artaxo, P., Laj, P., Hansel, A., Carbone, S., Kulmala, M., Andrade, M., Worsnop, D., Mohr, C. & Bianchi, F., Jan 2024, In: National science review. 11, 1, 11 p., nwad138.

Classification of extra-tropical cyclones with cluster analysis based on measures of intensity

Cornér, J., Bouvier, C. G. F. & Sinclair, V., 6 Jul 2023.

The relationship between extra-tropical cyclone intensity and precipitation in idealised current and future climates

Sinclair, V. A. & Catto, J. L., 4 Jul 2023, In: Weather and Climate Dynamics. 4, 3, p. 567-589 23 p.

Volcanically induced increase in extra-tropical cyclone frequency

Andreasen, L., Cornér, J., Abbott, P., Sinclair, V., Riede, F. & Timmreck, C., 15 May 2023.

Measurement report: Molecular-level investigation of atmospheric cluster ions at the tropical high-altitude research station Chacaltaya (5240 m a.s.l.) in the Bolivian Andes

Zha, Q., Huang, W., Aliaga, D., Peräkylä, O., Heikkinen, L., Koenig, A. M., Wu, C., Enroth, J., Gramlich, Y., Cai, J., Carbone, S., Hansel, A., Petäjä, T., Kulmala, M., Worsnop, D., Sinclair, V., Krejci, R., Andrade, M., Mohr, C. & Bianchi, F., 14 Apr 2023, In: Atmospheric Chemistry and Physics. 23, 7, p. 4559-4576 18 p.

Measurement report: Long-range transport and the fate of dimethyl sulfide oxidation products in the free troposphere derived from observations at the high-altitude research station Chacaltaya (5240 m a.s.l.) in the Bolivian Andes

Scholz, W., Shen, J., Aliaga, D., Wu, C., Carbone, S., Moreno, I., Zha, Q., Huang, W., Heikkinen, L., Jaffrezo, J. L., Uzu, G., Partoll, E., Leiminger, M., Velarde, F., Laj, P., Ginot, P., Artaxo, P., Wiedensohler, A., Kulmala, M., Mohr, C., & 4 othersAndrade, M., Sinclair, V., Bianchi, F. & Hansel, A., 19 Jan 2023, In: Atmospheric Chemistry and Physics. 23, 2, p. 895-920 26 p.

Daytime along-valley winds in the Himalayas as simulated by the Weather Research and Forecasting (WRF) model

Mikkola, J., Sinclair, V. A., Bister, M. & Bianchi, F., 18 Jan 2023, In: Atmospheric Chemistry and Physics. 23, 2, p. 821-842 22 p.

Relationships between extra-tropical cyclone intensity measures

Cornér, J., Bouvier, C. G. F. & Sinclair, V., 7 Sept 2022. 1 p.

Temporal evolution of features that control 10-m wind gusts in moist baroclinic wave simulations identified using non-linear regression

Bouvier, C. G. F., Cornér, J. & Sinclair, V., 5 Sept 2022. 1 p.

Boundary-layer height and surface stability at Hytiälä, Finland, in ERA5 and observations

Sinclair, V. A., Ritvanen, J., Urbancic, G., Statnaia, I., Batrak, Y., Moisseev, D. & Kurppa, M., 18 May 2022, In: Atmospheric Measurement Techniques. 15, 10, p. 3075-3103 29 p.

The SALTENA Experiment: Comprehensive Observations of Aerosol Sources, Formation, and Processes in the South American Andes

Bianchi, F., Sinclair, V. A., Aliaga, D., Zha, Q., Scholz, W., Wu, C., Heikkinen, L., Modini, R., Partoll, E., Velarde, F., Moreno, I., Gramlich, Y., Huang, W., Maximilian Koenig, A., Leiminger, M., Enroth, J., Peräkylä, O., Marinoni, A., Chen Xuemeng, Blacutt, L., & 22 othersForno, R., Gutierrez, R., Ginot, P., Uzu, G., Facchini, M. C., Gilardoni, S., Gysel-Beer, M., Cai, R., Petäjä, T., Rinaldi, M., Saathoff, H., Sellegri, K., Worsnop, D., Artaxo, P., Hansel, A., Kulmala, M., Wiedensohler, A., Laj, P., Krejci, R., Carbone, S., Andrade, M. & Mohr, C., 1 Feb 2022, In: Bulletin of the American Meteorological Society. 103, 2, p. E212-E229 18 p.

Influence of biogenic emissions from boreal forests on aerosol-cloud interactions

Petäjä, T., Tabakova, K., Manninen, A., Ezhova, E., O'Connor, E., Moisseev, D., Sinclair, V., Backman, J., Levula, J., Luoma, K., Virkkula, A., Paramonov, M., Räty, M., Äijälä, M., Heikkinen, L., Ehn, M., Sipilä, M., Yli-Juuti, T., Virtanen, A., Ritsche, M., & 7 othersHickmon, N., Pulik, G., Rosenfeld, D., Worsnop, D., Back, J., Kulmala, M. & Kerminen, V-M., Jan 2022, In: Nature Geoscience. 15, 1, p. 42-+ 18 p.

Identifying source regions of air masses sampled at the tropical high-altitude site of Chacaltaya using WRF-FLEXPART and cluster analysis

Aliaga, D., Sinclair, V. A., Andrade, M., Artaxo, P., Carbone, S., Kadantsev, E., Laj, P., Wiedensohler, A., Krejci, R. & Bianchi, F., 10 Nov 2021, In: Atmospheric Chemistry and Physics. 21, 21, p. 16453-16477 25 p.

Storm Aila: An unusually strong autumn storm in Finland

Rantanen, M., Laurila, T. K., Sinclair, V. & Gregow, H., Sept 2021, In: Weather. 76, 9, p. 306-312 7 p.

Delineation of dew formation zones in Iran using long-term model simulations and cluster analysis

Atashi, N., Rahimi, D., Sinclair, V. A., Zaidan, M. A., Rusanen, A., Vuollekoski, H., Kulmala, M., Vesala, T. & Hussein, T., 31 Aug 2021, In: *Hydrology and Earth System Sciences*. 25, 8, p. 4719-4740 22 p.

Radiosonde comparison of ERA5 and ERA-Interim reanalysis datasets over tropical oceans

Virman, M., Bister, M., Räisänen, J., Sinclair, V. & Järvinen, H., 26 May 2021, In: *Tellus. Series A: Dynamic Meteorology and Oceanography*. 73, 1, p. 1-7 7 p.

Climatology, variability, and trends in near-surface wind speeds over the North Atlantic and Europe during 1979–2018 based on ERA5

Laurila, T. K., Sinclair, V. A. & Gregow, H., 30 Mar 2021, In: *International Journal of Climatology*. 41, 4, p. 2253-2278 26 p.

Biogenic particles formed in the Himalaya as an important source of free tropospheric aerosols

Bianchi, F., Junninen, H., Bigi, A., Sinclair, V. A., Dada, L., Hoyle, C. R., Zha, Q., Yao, L., Ahonen, L. R., Bonasoni, P., Buenrostro Mazon, S., Hutterli, M., Laj, P., Lehtipalo, K., Kangasluoma, J., Kerminen, V. -M., Kontkanen, J., Marinoni, A., Mirme, S., Molteni, U., & 9 others Petäjä, T., Riva, M., Rose, C., Sellegri, K., Yan, C., Worsnop, D. R., Kulmala, M., Baltensperger, U. & Dommen, J., Jan 2021, In: *Nature Geoscience*. 14, 1, p. 4-+ 16 p.

Characteristics of extratropical cyclones and precursors to windstorms in northern Europe

Laurila, T. K., Gregow, H., Corner, J. S. & Sinclair, V., 2021, In: *Weather and Climate Dynamics*. 2, 4, p. 1111-1130 28 p.

Vertical Temperature Structure Associated with Evaporation of Stratiform Precipitation in Idealized WRF Simulations

Virman, M., Bister, M., Sinclair, V., Räisänen, J. & Järvinen, H., 4 May 2020, In: *Journal of the Atmospheric Sciences*. 77, 5, p. 1851–1864 14 p.

The characteristics and structure of extra-tropical cyclones in a warmer climate

Sinclair, V., Rantanen, M., Haapanala, P., Räisänen, J. & Järvinen, H., 3 Jan 2020, In: *Weather and Climate Dynamics*. 1, 1, p. 1-25 25 p.

The extratropical transition of Hurricane Ophelia (2017) as diagnosed with a generalized omega equation and vorticity equation

Rantanen, M., Räisänen, J., Sinclair, V. A., Lento, J. & Järvinen, H., 1 Jan 2020, In: *Tellus. Series A: Dynamic Meteorology and Oceanography*. 72, 1, p. 1-26 26 p.

The Extratropical Transition of Hurricane Debby (1982) and the Subsequent Development of an Intense Windstorm over Finland

Laurila, T., Sinclair, V. & Gregow, H., Jan 2020, In: *Monthly weather review*. 148, 1, p. 377-401 25 p.

The summer 2018 heatwave in Finland

Sinclair, V. A., Mikkola, J. W., Rantanen, M. & Raisanen, J., Nov 2019, In: *Weather*. 74, 11, p. 403-409 7 p.

Using the ECMWF OpenIFS model and state-of-the-art training techniques in meteorological education

Szepszo, G., Sinclair, V. & Carver, G., 8 Apr 2019, In: *Advances in Science and Research*. 16, p. 39-47 9 p.

Which Extratropical Cyclones Contribute Most to the Transport of Moisture in the Southern Hemisphere?

Sinclair, V. A. & Dacre, H. F., 16 Mar 2019, In: *Journal of Geophysical Research : Atmospheres*. 124, 5, p. 2525-2545 21 p.

Sensitivity of idealised baroclinic waves to mean atmospheric temperature and meridional temperature gradient changes

Rantanen, M., Räisänen, J., Sinclair, V. A. & Järvinen, H., Mar 2019, In: *Climate Dynamics*. 52, 5-6, p. 2703-2719 17 p.

Evaluating solar radiation forecast uncertainty

Tuononen, M., O'Connor, E. J. & Sinclair, V. A., 14 Feb 2019, In: *Atmospheric Chemistry and Physics*. 19, 3, p. 1985-2000 16 p.

Temperature response to evaporation of stratiform precipitation in idealized WRF simulations

Virman, M., Bister, M., Sinclair, V., Räisänen, J. & Järvinen, H., 2019, *Proceedings of The Center of Excellence in Atmospheric Science(CoE ATM): 'From Molecular and Biological processes to The Global Climate'*, Annual Seminar 2019. Laurila, T., Lintunen, A. & Kulmala, M. (eds.). Helsinki: Finnish Association for Aerosol Research FAAR, p. 722-724 3 p. (Report Series in Aerosol Science; no. 226).

Sensitivity of idealised baroclinic waves to different atmospheric temperature changes

Rantanen, M. P., Räisänen, J. A., Sinclair, V. A. & Järvinen, H. J., 11 Apr 2018.

A New Mechanism for the Dependence of Tropical Convection on Free-Tropospheric Humidity

Virman, M., Bister, M., Sinclair, V. A., Järvinen, H. & Räisänen, J., 16 Mar 2018, In: *Geophysical Research Letters*. 45, 5, p. 2516–2523 8 p.

Heat waves in Finland: present and projected summertime extreme temperatures and their associated circulation patterns

Kim, S., Sinclair, V. A., Räisänen, J. & Ruuhela, R., 15 Mar 2018, In: *International Journal of Climatology*. 38, 3, p. 1393–1408 16 p.

Evaporation of stratiform precipitation and its temperature response in idealized WRF simulations

Virman, M., Bister, M., Sinclair, V. A., Räisänen, J. & Järvinen, H., 2018, *Proceedings of 'The Centre of Excellence in Atmospheric Science (CoE ATM): 'From Molecular and Biological processes to The Global Climate', Annual Meeting 2018*. Haapanala, P., Lintunen, A., Enroth, J. & Kulmala, M. (eds.). Helsinki: Aerosolitutkimusseura ry – Finnish Association for Aerosol Research FAAR, p. 490-493 4 p. (Report Series in Aerosol Science ; no. 215).

Low-Level Jets over Utö, Finland, Based on Doppler Lidar Observations

Tuononen, M., O'Connor, E. J., Sinclair, V. A. & Vakkari, V., Sept 2017, In: *Journal of Applied Meteorology and Climatology*. 56, 9, p. 2577-2594 18 p.

OZO v.1.0: software for solving a generalised omega equation and the Zwack-Okossi height tendency equation using WRF model output

Rantanen, M., Räisänen, J., Lento, J., Stepanyuk, O., Räty, O., Sinclair, V. A. & Järvinen, H., 21 Feb 2017, In: *Geoscientific Model Development*. 10, 2, p. 827-841 15 p.

Factors affecting atmospheric vertical motions as analyzed with a generalized omega equation and the OpenIFS model

Stepanyuk, O., Räisänen, J., Sinclair, V. A. & Järvinen, H., 2017, In: *Tellus. Series A: Dynamic Meteorology and Oceanography*. 69, 10 p., 1271563.

Lower tropospheric warm anomalies observed after precipitation over tropical oceans

Virman, M. T., Bister, M. H., Sinclair, V. A., Järvinen, H. J. & Räisänen, J. A., 2017, *Proceedings of 'the Center of Excellence in Atmospheric Sciences (CoE ATM) - From Molecular and Biological Processes to the Global Climate': Annual Meeting 2017*. Haapanala, P., Lintunen, A., Enroth, J. & Kulmala, M. (eds.). Helsinki: Finnish Association for Aerosol Research, p. 558-560 3 p. (Report Series in Aerosol Science; no. 202).

The sensitivity of idealised baroclinic waves to environmental temperature changes

Rantanen, M. P., Räisänen, J. A., Sinclair, V. A. & Järvinen, H. J., 2017, *Proceedings of "The Centre of Excellence in Atmosphere Science (CoE ATM) - From Molecular and Biological Processes To the Total Climate" Annual Meeting 2017*. Haapanala, P., Lintunen, A., Enroth, J. & Kulmala, M. (eds.). Helsinki: Finnish Association for Aerosol Research FAAR, p. 456-459 4 p. (Report Series in Aerosol Science; vol. 202).

BAECC: A Field Campaign to Elucidate the Impact of Biogenic Aerosols on Clouds and Climate

Petäjä, T., O'Connor, E. J., Moisseev, D., Sinclair, V. A., Manninen, A. J., Väänänen, R., von Lerber, A., Thornton, J. A., Nicoll, K., Petersen, W., Venkatachalam, C., Smith, J. N., Winkler, P. M., Krüger, O., Hakola, H., Timonen, H., Brus, D., Laurila, T., Asmi, E., Riekola, M-L., & 11 othersMona, L., Massoli, P., Engelmann, R., Komppula, M., Wang, J., Kuang, C., Bäck, J., Virtanen, A., Levula, J., Ritsche, M. & Hickmon, N., 22 Nov 2016, In: *Bulletin of the American Meteorological Society*. 97, 10, p. 1909-1928 20 p.

Observational evidence for aerosols increasing upper tropospheric humidity

Riuttanen, L., Bister, M., Kerminen, V.-M., John, V. O., Sundstrom, A.-M., Dal Maso, M., Räisänen, J., Sinclair, V. A., Makkonen, R., Xausa, F., De Leeuw, G. & Kulmala, M., 17 Nov 2016, In: *Atmospheric Chemistry and Physics*. 16, 22, p. 14331-14342 12 p.

How dual-polarization radar observations can be used to verify model representation of secondary ice

Sinclair, V. A., Moisseev, D. & von Lerber, A., 27 Sept 2016, In: *Journal of Geophysical Research : Atmospheres*. 121, 18 , p. 10954-10970 17 p.

Humidity and temperature structures associated with deep convection

Virman, M. T., Bister, M. H., Sinclair, V. A. & Järvinen, H. J., 2016, *Proceedings of the Centre of Excellence in Atmospheric Sciences (CoE ATM) – From Molecular and Biological Processes to the Global Climate Annual Meeting 2016*. Lintunen, A., Enroth, J., Häme, S. & Kulmala, M. (eds.). Helsinki: Finnish Association for Aerosol Research, p. 468-470 3 p. (Report Series in Aerosol Science; no. 189).

OZO: a software for solving a generalized omega equation and the Zwack-Okossi height tendency equation using WRF model output

Rantanen, M. P., Räisänen, J. A., Lento, J., Stepanyuk, O., Räty, O., Sinclair, V. A. & Järvinen, H. J., 2016, In: Report Series in Aerosol Science. 189, p. 403-406

Force balances and dynamical regimes of numerically simulated cold fronts within the boundary layer

Sinclair, V. & Keyser, D., Jul 2015, In: *Quarterly Journal of the Royal Meteorological Society*. 141, 691, p. 2148-2164 17 p.

A climatology of low-level jets in the mid-latitudes and polar regions of the Northern Hemisphere

Tuononen, M., Sinclair, V. A. & Vihma, T., 2015, In: *Atmospheric science letters*. 16, 4, p. 492-499 8 p.

Estimates of global dew collection potential on artificial surfaces

Vuollekoski, H., Vogt, M., Sinclair, V. A., Duplissy, J., Jarvinen, H., Kyro, E. -M., Makkonen, R., Petaja, T., Prisle, N. L., Räisänen, P., Sipila, M., Ylhaisi, J. & Kulmala, M., 2015, In: *Hydrology and Earth System Sciences*. 19, 1, p. 601-613 13 p.

A 6-yr climatology of fronts affecting Helsinki, Finland and their boundary layer structure

Sinclair, V., Sept 2013, In: *Journal of Applied Meteorology and Climatology*. 52, 9, p. 2106-2124 21 p.

FLAMO - flexible atmospheric model: a new high-resolution 3d regional model to study atmospheric processes in the planetary boundary layer

Kokkati Venugopalan, G., Vuollekoski, H., Sinclair, V., Hellsten, A., Kulmala, M. & Boy, M., 2013, *Proceedings of FCoE in 'Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change' Annual Meeting 2013*. p. 276-278 3 p. (Report Series in Aerosol Science; vol. Nro 142 (2013)).

Structure of a Narrow Cold Front in the Boundary Layer: Observations versus Model Simulation

Sinclair, V. A., Niemela, S. & Leskinen, M., 1 Aug 2012, In: *Monthly weather review*. 140, 8, p. 2497-2519 23 p.

Structure of a Warm Front: Helsinki Testbed Observations and Model Simulation

Kemppi, M. & Sinclair, V., 1 Sept 2011, In: *Monthly weather review*. 139, 9, p. 2876-2900 25 p.

Controls on boundary layer ventilation: boundary layer processes and large scale dynamics.

Sinclair, V. A., Gray, S. & Belcher, S., 2010, In: *Journal of Geophysical Research*. 115 , D11107, 12 p.

Synoptic Controls on Boundary-Layer Characteristics

Sinclair, V., Belcher, S. E. & Gray, S., 2010, In: *Boundary-Layer Meteorology*. 134, 3, p. 387-409 23 p.

Boundary-layer ventilation by baroclinic life cycles

Sinclair, V., 1 Mar 2009, 168 p.

Boundary layer ventilation by baroclinic lifecycles

Sinclair, V. A., Gray, S. & Belcher, S., 2008, In: Quarterly Journal of the Royal Meteorological Society. 134, 635, p. 1409-1424 16 p.

Weather and climate modelling

Klingaman, N. & Sinclair, V., 24 Aug 2007, In: Weather. 62, 9, p. 257–258 2 p.