

List of publications

Ari Karppinen

Dissertation

1. Karppinen, A., 2001. Meteorological pre-processing and atmospheric dispersion modelling of urban air quality and applications in the Helsinki Metropolitan Area.

1. Articles in journals

1.1. Articles in refereed scientific journals

2. Karppinen, A., Joffre, S. and Vaajama, P., 1997. Boundary layer parametrization for Finnish regulatory dispersion models. *International Journal of Environment and Pollution* **8**, pp. 557-564.
3. Kukkonen, J., Härkönen, J., Valkonen, E., Karppinen, A. and Rantakrans, E., 1997. Regulatory dispersion modelling in Finland. *International Journal of Environment and Pollution* **8**, pp. 782-788.
4. Karppinen, A., Kukkonen, J., Konttinen, M., Härkönen, J., Valkonen, E., Rantakrans, E., Koskentalo, T., and Elolähde, T., 1998. The emissions, dispersion and chemical transformation of traffic-originated nitrogen oxides at the Helsinki metropolitan area. *International Journal of Vehicle Design* **20**, pp.131-136.
5. Härkönen, J., Kukkonen, J., Valkonen, E. and Karppinen, A., 1998. The influence of vehicle emission characteristics and meteorological conditions on urban NO₂ concentrations. *International Journal of Vehicle Design* **20**, pp.125-130.
6. Karppinen, A., Kukkonen, J., Elolähde, T., Konttinen, M., Koskentalo, T. and Rantakrans, E., 2000. A modelling system for predicting urban air pollution, Model description and applications in the Helsinki metropolitan area. *Atmospheric Environment* **34**, pp. 3723-3733.
7. Karppinen, A., Kukkonen, J., Elolähde, T., Konttinen, M. and Koskentalo, T., 2000. A modelling system for predicting urban air pollution, Comparison of model predictions with the data of an urban measurement network. *Atmospheric Environment* **34**, pp. 3735-3743.
8. Kukkonen, J., Valkonen, E., Walden, J., Koskentalo, T., Karppinen, A., Berkowicz, R. and Kartastenpää, R., 2000. Measurements and modelling of air pollution in a street canyon in Helsinki. *Environmental Monitoring and Assessment* **65**, pp. 371-379.

9. Pechinger, U., Dittmann, E., Erbes, G., Johansson, P., Karppinen, A., Musson-Genon L., Omstedt, G., Tercier, P., 2000. Intercomparison of methods for parameterizing components of the surface energy balance - a summary of Working Group 1 - COST 710 results. *International Journal of Environment and Pollution* **14**, pp. 558-564.
10. Karppinen, A., Joffre, S. M. and Kukkonen, J. 2000. The refinement of a meteorological preprocessor for the urban environment. *International Journal of Environment and Pollution* **14**, pp. 565-572.
11. Kukkonen, J., Valkonen, E., Walden, J., Koskentalo, T., Aarnio, P., Karppinen, A., Berkowicz, R. and Kartastenpää, R., 2001. A measurement campaign in a street canyon in Helsinki and comparison of results with predictions of the OSPM model. *Atmospheric Environment* **35**, pp. 231-243.
12. Kukkonen, J., Härkönen, J., Walden, J., Karppinen, A. and Lusa, K., 2001. Evaluation of the dispersion model CAR-FMI against data from a measurement campaign near a major road. *Atmospheric Environment* **35**, pp 949-960.
13. Kousa, A., Kukkonen, J., Karppinen, A., Aarnio, P. and Koskentalo, T., 2001. Statistical and diagnostic evaluation of a new-generation urban dispersion modelling system against an extensive dataset in the Helsinki Area. *Atmospheric Environment* **35**, pp. 4617-4628.
14. Kukkonen, J., Härkönen, J., Karppinen, A., Pohjola, M., Pietarila, H. and Koskentalo, T., 2001. A semi-empirical model for urban PM₁₀ concentrations, and its evaluation against data from an urban measurement network. *Atmospheric Environment* **35**, pp. 4433-4442.
15. Kukkonen, J., Härkönen, J., Walden, J., Karppinen, A. and Lusa, K., 2001. Validation of the dispersion model CAR-FMI against measurements near a major road. *International Journal of Environment and Pollution*, **16** (1-6), pp.137-147.
16. Karppinen, A., Joffre, S.M., Kukkonen, J. and Bremer, P., 2001. Evaluation of inversion strengths and mixing heights during extremely stable atmospheric stratification, *International Journal of Environment and Pollution* **16** (1-6), pp. 603-613.
17. Kousa, A., Kukkonen, J., Karppinen, A., Aarnio, P. and Koskentalo, T., 2002. A model for evaluating the population exposure to ambient air pollution in an urban area. *Atmospheric Environment* **36**, pp. 2109-2119.
18. Tiitta, P., Raunemaa, T., Tissari, J., Yli-Tuomi, T., Leskinen, A., Kukkonen, J., Härkönen, J. and Karppinen, A., 2002. Measurements and Modelling of PM_{2.5} Concentrations Near a Major Road in Kuopio, Finland. *Atmospheric Environment* **36**, pp. 4057-4068
19. Pohjola, M.A., Kousa, A., Kukkonen, J., Härkönen, J., Karppinen, A., Aarnio, P., Koskentalo, T., 2002. The Spatial and Temporal Variation of Measured Urban PM₁₀ and PM_{2.5} concentrations in the Helsinki Metropolitan Area. *International Journal on Water, Air and Soil Pollution: Focus* **2** (5-6), pp. 189-201.

20. Piringer, M., Grimmond, C.S.B., Joffre, S.M., Mestayer, P., Rotach, M., Baklanov, A., De Ridder, K., Ferreira, J., Guilloteau, E., Karppinen, A., Martilli, A., Masson, V., Middleton, D.R. and Tombrou, M., 2002. Investigating the Surface Energy Balance in Urban Areas –Recent Advances and Future Needs. *International Journal on Water, Air and Soil Pollution: Focus*, **2** (5-6), pp. 1-16.
21. Kukkonen, J., Partanen, L., Karppinen, A., Walden, J., Kartastenpää, R., Aarnio, P., Koskentalo, T. and Berkowicz, R., 2003. Evaluation of the OSPM model combined with an urban background model against the data measured in 1997 in Runeberg Street, Helsinki. *Atmospheric Environment* **37**(8), pp. 1101-1112.
22. Kukkonen, J., Partanen, L., Karppinen, A., Ruuskanen, J., Junninen, H., Kolehmainen, M., Niska, H., Dorling, S., Chatterton, T., Foxall, R. and Cawley, G., 2003. Extensive evaluation of neural network models for the prediction of NO₂ and PM₁₀ concentrations, compared with a deterministic modelling system and measurements in central Helsinki, *Atmospheric Environment*, **37**(32), pp. 4539-4550.
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25. Karppinen, A., Härkönen, J., Kukkonen, J., Aarnio, P. and Koskentalo, T., 2004. Statistical model for assessing the portion of fine particulate matter transported regionally and long-range to urban air. *Scandinavian Journal of Work, Environment & Health*, **30** suppl. 2: 47-53.
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29. Eresmaa, N, Karppinen, A, Joffre, S, Räsänen, J. and Talvitie, H., 2005. Mixing height determination by ceilometer, *Atmospheric Chemistry and Physics Discussion*, Special Issue ,Urban Meteorology and Atmospheric Pollution (EMS-FUMAPEX), pp. 12697-12722. SRef-ID: 1680-7375/acpd/2005-5-12697.

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34. Saarikoski, S., Sillanpää, M., Sofiev, M., Timonen, H., Saarnio, K., Teinilä, K., Karppinen, A., Kukkonen, J. and Hillamo, R., 2007. Major biomass burning episode in northern Europe in spring 2006: the chemical composition and atmospheric chemistry of aerosols. *Atmospheric Environment* , [http://dx.doi.org 10.1016/j.atmosenv.2006.12.053](http://dx.doi.org/10.1016/j.atmosenv.2006.12.053) (in press)
35. Päivi Aarnio, Jyrki Martikainen, Tareq Hussein, Ilkka Valkama, Hanna Vehkamäki, Larisa Sogacheva, Jari Härkönen, Ari Karppinen, Tarja Koskentalo, Jaakko Kukkonen, Markku Kulmala, 2007. Analysis and evaluation of selected PM10 episodes in the Helsinki Metropolitan Area in 2002. *Atmospheric Environment*. [http://dx.doi.org /10.1016/j.atmosenv.2007.02.008](http://dx.doi.org/10.1016/j.atmosenv.2007.02.008) (in press).
36. Martin Piringer, Sylvain Joffre, Alexander Baklanov, Andreas Christen, Marco Deserti, Koen De Ridder, Stefan Emeis, Patrice Mestayer, Maria Tombrou, Ari Karppinen, Douglas Middleton, Jerzy Burzynski, Kathrin Baumann – Stanzer, Aggeliki Dandou, 2007. The surface energy balance and the mixing height. The surface energy balance and the mixing height in urban areas – findings and recommendations of COST-Action 715 , *Boundary Layer Meteorology* (in press).
37. Pohjola, M.A., Pirjola, L., Karppinen, A., Härkönen, J., Ketznel, M., Kukkonen, J., 2006. Evaluation of a coupled dispersion and aerosol process model against measurements near a major road. *Atmospheric Chemistry and Physics Discussions*, Vol. 7, pp. 2819-2856, 1. SRef-ID: 1680-7375/acpd/2007-7-2819.
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39. Jaakko Kukkonen, Ranjeet Sokhi, Lakhu Luhana, Jari Härkönen, Timo Salmi and Ari Karppinen, 2007. Evaluation and application of a statistical model for assessment of long-range transported proportion of PM2.5 in United Kingdom and Finland, *Atm. Env.* <http://dx.doi.org/10.1016/j.atmosenv.2007.02.036> ,in press.

1.2 Other articles in journals , newspapers and books

40. Karppinen, A., 1988. Happamoitumisprojekti - ilmansuojelua ja tutkimusta. ATS Ydintekniikka, 2/88, vol. 17, ss. 9-10.
41. Kukkonen, J., Karppinen, A., Härkönen, J. ja Valkonen, E., 1996. Paikallisen ilmanlaadun mallintaminen. Magazine of the Finnish Air Pollution Prevention Society, Ilmansuojelu 4, s. 6-9.
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45. Kousa, A., P. Aarnio, T. Koskentalo, A. Karppinen ja J. Kukkonen, 2001. Altistusmallin kehittäminen – Expand. Ilmansuojelu 4/2001, ss. 27-30.
46. Karppinen, A., Kousa, A. ja Kukkonen, J., 2001. EXPAND arvioi altistumista ilman epäpuhtauksille. YMPÄRISTÖ + tekniikka, 4/2001. ss. 20-21.
47. Karppinen, A., 2002. Rajakerroksen toiminta ja vaikutus saasteiden leviämiseen [The dispersion of pollutants in the atmospheric boundary layer]. Ilmansuojelu-lehti, 4/2002, pp. 11-15.
48. Pohjola, M.A., Rantamäki, M., Kukkonen, J., Karppinen, A., Berge, E., 2004. Meteorological evaluation of an Air Pollution Episode in Helsinki in December 1995. Ilmansuojelu (Magazine of the Finnish Air Pollution Prevention Society), 3/2004, pp. 8-14.
49. Rantamäki, M. & Karppinen, A., 2005. Ilmanlaatu talvella. Ilmansuojelu (Magazine of the Finnish Air Pollution Prevention Society) 3/2005, s. 16-19. Ilmansuojeluyhdistys 2005
50. A. Karppinen, 2006. Ilmanlaadun leviämismallien kehitystyö ilmatieteen laitoksella. In: Huutoniemi, K., Estlander, A., Hahkala, M., Hämekoski, K., Kulmala, A., Lahdes, R., Laukkanen, T. (eds.) : ”Savuntarkistajista päästökauppiaisiin – Suomalaisen ilmansuojelun historia”, Ilmansuojeluyhdistys ry., Helsinki, Finland.
51. Rantamäki M., Karppinen A. ja R. Hillamo, 2006. Ilman hiukkaspitoisuudet kohosivat huhtikuun loppupuolella, Ilmastokatsaus 04/06, Ilmatieteen laitos, s. 14

2. Research reports

2.1 Research reports in English

52. Karppinen, A., Nordlund, G., Rossi, J., Valkama, I. and Vuori, S., 1987. Description and application of a system for calculating radiation doses due to long range transport of radioactive releases, Raportteja - Ilmatieteen laitos ISBN 951-697-251-9, ISSN 0782-6079.
53. Kangas, L., Hongisto, M., Juntto, S., Karppinen, A., Laurila, T. and Nordlund, G., 1991. Analysis of differences between EMEP model calculations and measured data of concentrations and depositions in Finland. Finnish Meteorological Institute, Helsinki, 46 p.
54. Pechinger, U., Dittman, E., Erbes, G., Johansson, P.-E., Karppinen, A., Musson-Genon, L., Omstedt, G. and Tercier, P., 1997. The surface energy balance. COST action 710 "Harmonisation in the preprocessing of meteorological data for atmospheric dispersion models", Report of Working Group 1, European Commission, Brussels, 64 p.
55. Kukkonen, J., Joffre, S. and Karppinen, A. 2001. Status Report of Finland. In: Kukkonen, J. (ed.), COST action 715, Meteorology applied to Urban Air Pollution Problems, Working Group 3, Status Report. Directorate-General for Research, Information and Communication Unit, European Commission. Brussels, pp. 27-32..
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57. Piringer, M., Joffre, S. (eds.); Baklanov, A., Burzynski, J., Christen, A., Deserti, M., De Ridder, K., Emeis, S., Karppinen, A., Mestayer, P., Middleton, D., Tombrou, M. (lead authors), 2005. The urban surface energy budget and mixing height in European cities: data, models and challenges for urban meteorology and air quality. Final Report of Working Group 2 of COST-715 Action. ISBN 954-9526-29-1, Demetra Ltd Publishers, Bulgaria. 239 pp.

2.2 Research reports in Finnish

58. Vuorio, M., Karppinen, A. and Nordlund, G., 1985. Radioaktiivinen laskeuma ydinsotatilanteessa, Maanpuolustuksen tieteellinen neuvottelukunta, Raporttisarja A (in Finnish) (ISSN 0357-7279), ISBN 0357-7279.
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60. Häkkinen, A. J. and Karppinen, A., 1992 . Outokumpu Harjavalta Metals Oy:n Harjavallan tehtaiden vuoden 1991 prosessitilanteessa eri päästövaihtoehdoilla ja suunnitteluvaihtoehossa eri piipunkorkeuksilla aiheuttamat ulkoilman

rikkidioksidipitoisuudet ja rikkilaskeumat. Ilmatieteen laitoksen raportti, Helsinki, 76 p + appendices.

61. Karppinen, A., Kartastenpää, R., Pesonen, R., Pietarila, H., Rantakrans, E., Vallinoja, I., Aarnio, P., Koskentalo, T., Myllynen, M., Taipale, L., and Komsu, J., 1997. Typen oksidien alueelliset leviämislaskelmat. In: Korhonen M. ja Thun R. (toim.), SIHTI 2 Energia- ja ympäristöteknologia – Tutkimusohjelman vuosikirja 1995 – Projektiesittelyt. VTT Energia ja VTT Kemianteekniikka, Espoo, p. 162-176.
62. Pesonen, R., Rantakrans, E., Pietarila, H., Karppinen, A., Aarnio, P., Koskentalo, T. and Myllynen, M., 1997. Typen oksidien alueelliset leviämislaskelmat. In: Korhonen M. ja Thun R. (toim.), SIHTI 2 Energia- ja ympäristöteknologia – Tutkimusohjelman vuosikirja 1996 – Projektiesittelyt. VTT Energia ja VTT Kemianteekniikka, Espoo, p. 49-58.
63. Karppinen, A., 1998. Typen oksidien rajoittamisen taloudellisesti tehokas valinta. Lisensiaattitutkielma, Teknillinen korkeakoulu, Otaniemi., 74 p. + appendices.

3. Conference publications and publications in series

3.1 Publications in series in English

64. Härkönen, J., Valkonen, E., Kukkonen, J., Rantakrans, E., Lahtinen, K., Karppinen, A. and Jalkanen, L., 1996. A model for the dispersion of pollution from a road network. Finnish Meteorological Institute, Publications on Air Quality 23. Helsinki, 34 p.
65. Karppinen, A., Kukkonen, J., Nordlund, G., Rantakrans, E. and Valkama, I., 1998. A dispersion modelling system for urban air pollution. Finnish Meteorological Institute, Publications on Air Quality 28. Helsinki, 58 p.
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67. Karppinen, A., Kukkonen, J., Härkönen, J., Nikmo, J., Pohjola, M., Wallenius, L., Granberg, M., Niittymäki, J. P., Aarnio, P., Koskentalo, T. and Kousa, A., 2002. Development of Integrated Air Pollution Modelling Systems for Urban Planning - DIANA (M2T9912), In: Mäkelä, S. (ed.): Mobile² Annual Book 2001, ISSN 1237-5721, VTT Energy, Engine Technology and Emissions for Transportation, Espoo, January 2002, pp. 77-92.
68. Karppinen, A., Kukkonen, J., Härkönen, J., Nikmo, J., Pohjola, M., Wallenius, L., Granberg, M., Niittymäki, J. P., Aarnio, P., Koskentalo, T. and Kousa, A., 2002. Development of Integrated Air Pollution Modelling Systems for Urban Planning - DIANA (M2T9912), Final Report, VTT Energy, Engine Technology and Emissions for Transportation, Espoo, May 2002 (M2T9912-2).
69. Kukkonen, J., Härkönen, J., Karppinen, A., Kauhaniemi, M., Pohjola, M., Riikonen, K., Alaviippola, B., Aarnio, P., Alm, S., Hänninen, O., Jantunen, M., Koistinen, K., Pekkanen, J., Tainio, M., Tuomisto, J., Vallius, M., 2005. Health effects caused by urban air pollution for the transport system plan scenarios in Helsinki area- HEAT. In: Rautalahti, M., Laivisto, V. (eds.) : GEMS of the Health Promotion Research Programme, ISBN 951-96249-9-6, Cancer Society of Finland, Juvanes Print, Tampere, pp. 54-62.

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70. Karppinen, A., 1987. An economical optimization model for the reduction of NO_x emissions. In: Anttila, P. and Kauppi, P. (eds.), Abstracts of the Symposium of the Finnish Research Project on Acidification (HAPRO), ISSN 0783-280X, ISBN 9512-47-0422-3, Helsinki.
71. Karppinen, A., 1990. Cost-effective way of reducing emissions of nitrogen oxides. In: Kulmala, M. and Kukkonen, J. (eds.), Workshop on the Atmospheric Chemistry and

Physics, Lappeenranta, Finland, August 21-22, 1990. Lappeenranta University of Technology, Report EN D-19.

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73. Karppinen, A., Kukkonen, J., Valkonen, E., Härkönen, J., Rantakrans, E., Jalkanen, L., Haarala, S., Walden, J., Koskentalo, T., Elolähde, T., Aarnio, P. and Laurikko, J., 1996. Model predictions on urban air quality and their comparison to measurements. In: Gryning, S.-E. and Schiermeier, F. (eds.), Air pollution modelling and its application XI, NATO, Challenges of Modern Society, Volume 21. New York and London, pp. 649-651.
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