

WINDLAB SYSTEMS STAFF

Academic publications and conference presentations relevant to wind energy and atmospheric modelling.

KEITH AYOTTE

Publications:

Scientific Papers:

- Ayotte, K.W. and Hughes, D.E., 2004:** Observations of Boundary Layer Wind Tunnel Flow over Isolated Ridges of Varying Steepness and Roughness, *Boundary Layer Meteorology*, **112 (3)**, 525-556
- Ayotte, K.W., Davy, R.J. and Coppin, P.A., 2001:** A Simple Temporal and Spatial Analysis of Flow in Complex Terrain in the Context of Wind Energy Modelling. *Boundary Layer Meteorology*, **98**, 275-295
- Ayotte, K.W., Finnigan, J.J. and Raupach, M.R., 1999:** A Second Order Closure for Neutrally Stratified Vegetative Canopy Flows, *Boundary Layer Meteorology*, **90**, 189-216
- Ayotte, K.W. 1997:** Optimization of Upstream Profiles in Modelling Flow Over Complex Terrain. *Boundary Layer Meteorology*, **83**, 285-309
- Ayotte, K.W. 1997:** The K(Ri) Closure Scheme, in Mong, C-H.(Ed), Proceedings from: The Planetary Boundary Layer and Its Parameterization, National Centre for Atmospheric Research, Advanced Study Program Colloquium, 24.July-4.August, 1995, Boulder, Colorado
- Ayotte, K.W., Sullivan P., Andren, A., Doney, S.C., Holtslag, A.A.M., Large, W.G., McWilliams, J.C., Moeng, C-H., Otte, M.J., Tribbia, J.J., Wyngaard, J.C., 1996:** An Evaluation of Neutral and Convective Planetary Boundary Layer Parameterizations Relative to Large Eddy Simulation., *Boundary Layer Meteorology*, **79**, 131-175
- Ayotte, K.W. and Taylor, P.A., 1995:** A mixed spectral finite difference three-dimensional model of neutral planetary boundary layer flow over topography., *J. Atmos. Sciences.*, **52**, No. 20, 3523-3537
- Ayotte, K.W., Xu, D. and Taylor, P.A., 1994:** The impact of turbulence closure schemes on predictions of the mixed spectral finite-difference model for flow over topography. *Boundary Layer Meteorology*, **70**, 341-367
- Ayotte, K.W. 1995:** Source code generation for linear and nonlinear numerical models using Maple., *MapleTech.* Vol. 2, No. 1, 39-48.
- Taylor, P.A., Xu, D., Gong, W. and Ayotte, K. W. 1993.** Modeling Turbulent Boundary-Layer Flow over 2D Sinusoidal Waves. Proc. Symposium on the Air-Sea Interface, Marseille, France. M.Donelan, ed Kluwer Academic Publishers
- Taylor, P.A. and Ayotte, K.W., 1992.** Mesoscale blocking ahead of mountain ridges. Proceedings of the IMA conference on Stably Stratified Flows: Flow and Dispersion over Topography. I.P. Castro and N.J. Rockliff, eds.Oxford University Press.
- Xu, D., Ayotte, K.W. and Taylor , P.A. 1994.** Development of the NLMSFD Model of Turbulent Boundary-Layer Flow over Topography., *Boundary Layer Meteorology*, **70**, 341-367
- Steyn, D.G. and Ayotte, K.W., 1985:** Application of two-dimensional terrain height spectra to mesoscale modeling., *J. Atmos. Sciences.*, **42**, 2884-2887

Invited Presentations:

- Ayotte, K.W., Finnigan, J.J. and Raupach, M.R., 1997.** A Second Order Closure for Neutrally Stratified Canopy Flows. Clear and Cloudy Boundary Layers, Colloquium of the Royal Netherlands Academy of Arts and Sciences. Amsterdam, the Netherlands, 26-29 August 1997
- Ayotte, K.W., 1997.** Modelling Turbulent Flow over Complex Terrain: Canopy Flows, Adjoint Optimization and Internet Distribution, Risoe National Laboratory, Roskilde, Denmark, 21 August 1997
- Ayotte, K.W., 1997,** Recent Advances in Modelling Turbulent Flow in Complex Terrain, NCAR Summer Colloquium Series, National Center for Atmospheric Research, Boulder Colorado, 7 August 1997

Conference Presentations:

- Ayotte, K.W., 2005** Modeling flow in and above vegetative canopies for wind energy applications, presented at WINDPOWER 2005, Denver CO, May 2005.
- Ayotte, K.W., 2002:** A Nonlinear Wind Flow Model for Wind Energy Resource Assessment in Steep Terrain, presented at Global WindPower, Paris, April 2002.
- Steggel, N., Ayotte, K.W. and Davy, R.J., 2002:** Wind Prospecting in Australia with *WindScape* -presented at Global WindPower, Paris, April 2002.
- Steggel, N., Ayotte, K.W., Davy, R.J. and Coppin, P.A., 2001:** *WindScapeTM* – A Regional Wind Resource Mapping Tool, in Proceedings of 2001 European Wind Energy Conference, Copenhagen, Denmark, 2-6 July 2001.
- Ayotte, K.W., Finnigan, J.J. and Raupach, M.R., 1997,** A Second Order Turbulence Closure for Vegetation Canopies, 12th Symposium on Boundary Layers and Turbulence, 28 July - 1 August 1997, Vancouver, British Columbia
- Ayotte, K. W., 1997,** Optimisation of Mean Flow Profiles Using an Adjoint Method, 12th Symposium on Boundary Layers and Turbulence, 28 July - 1 August 1997, Vancouver, British Columbia
- Ayotte, K.W., 1997,** Network Distributed Solutions for Flow in Complex Terrain, 12th Symposium on Boundary Layers and Turbulence, 28 July - 1 August 1997, Vancouver, British Columbia
- Ayotte, K.W. and Coppin, P.A., 1997,** An Adjoint Method for Optimising Upstream Boundary Conditions in Modelling Flow in Complex Terrain, Fourth Asia-Pacific Symposium on Wind Engineering, ANA Gold Coast, Australia, 14-16 July 1997
- Ayotte, K.W., 1997,** Optimisation of Flow Profiles in Limited Area Models Using an Adjoint Method, 1997 Assembly of the International Association of Meteorology and Atmospheric Sciences, Melbourne, Australia, 1 - 9 July 1997
- Ayotte, K.W., Finnigan, J.J. and Raupach, M.R., 1997,** A Second Order Closure for Canopies, 1997 Assembly of the International Association of Meteorology and Atmospheric Sciences, Melbourne, Australia, 1 - 9 July 1997
- Ayotte, K.W. 1994:** A Simple Three-Dimensional Model of Planetary Boundary Layer Flow over Topography. 6th AMS Conference on Mesoscale Processes. Portland, Oregon, July 18-22
- Ayotte, K.W., Sullivan, P., and Moeng, C-H. 1994.** An Evaluation of Planetary Boundary Layer Models Using Large Eddy Simulation. 6th AMS Conference on Mesoscale Processes. Portland, Oregon, July 18-22.
- Taylor, P. A. and Ayotte, K.W., 1992.** Mesoscale blocking ahead of mountain ridges (and cold fronts). 6th AMS Conference on Mountain Meteorology, Portland, Oregon, Sept. 19 - Oct. 2
- Ayotte, K.W. and Xu, D., 1992.** The impact of different turbulence closures on predictions of the mixed spectral finite-difference model of flow over topography. American Meteorological Society, Tenth Symposium of Turbulence and Diffusion, Portland, Oregon, Sept. 19 - Oct. 2.
- Xu, D., Ayotte, K.W. and Taylor, P.A., 1992.** Simulations of turbulent flow over a hill by a q^2 /level 4 closure model. American Meteorological Society, Tenth Symposium of Turbulence and Diffusion, Portland, Oregon, Sept. 19 - Oct. 2.
- Ayotte, K.W.; 1992.** Higher order closure in the mixed spectral finite-difference model of flow over topography. Workshop on Computations of Boundary Layer Flows Over Hills, CERFACS, Toulouse, France. July 27-28.
- Ayotte, K.W.; 1992.** Higher order closure in turbulent flow over hills. NCAR, Mesoscale and Microscale Meteorology Division. Geophysical Turbulence Seminar Series, June (invited talk)
- Ayotte, K.W. and Taylor, P.A., 1992.** Boundary layer processes near and over Lake Ontario. Canadian Meteorological and Oceanographical Society, 26th Annual Congress Laval University, Quebec City, June 8-12.
- Taylor, P. A. and Ayotte, K.W., 1992.** Mesoscale blocking ahead of cold fronts and mountain ridges. Canadian Meteorological and Oceanographical Society, 26th Annual Congress Laval University, Quebec City, June 8-12
- Ayotte, K.W. and Taylor, P.A., 1992.** The role of boundary layer processes in determining parcel trajectories in flow over Lake Ontario. International Association for Great Lakes Research Conference, University of Waterloo, Waterloo, Ontario, May 31-June 4.

Additional Information:

Keith Ayotte has acted as a Referee for:

Boundary Layer Meteorology
Journal of Applied Meteorology
Quarterly Journal of the Royal Meteorological Society
Journal of Geophysical Research - Atmospheres
Journal of the Atmospheric Sciences

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Primary author

- Steggel, N., Ayotte, K.A., Davy, R.J. and Coppin, P.A. (2002) Wind Prospecting with *WindScape* in Australia, presented at *Global WindPower 2002, Paris, April 2002*.
- Steggel, N., Ayotte, K.A., Davy, R.J. and Coppin, P.A. (2002) Wind Prospecting with *WindScape*, *Internal Report, CSIRO Land & Water, March 2002*.
- Steggel, N., Ayotte, K.A., Davy, R.J. and Coppin, P.A. (2001) *WindScape* – Development of a regional wind resource mapping tool, in *Proceedings of European Wind Energy Conference and Exhibition, Copenhagen, July 2001*.
- Steggel, N. (1999) Boundary layer simulation in the EnFlo wind tunnel, *EnFlo Internal report, University of Surrey, UK*.
- Steggel, N. and Castro, I.P. (1999) Effect of stable stratification on the flow behind obstacles submerged in turbulent boundary layers, in *Wind Engineering into the 21st Century, Proceedings of the 10th International Conference on Wind Engineering, Copenhagen, June 1999*.
- Steggel, N. and Castro, I.P. (1999) Effects of stable stratification on dispersion characteristics behind a two-dimensional fence submerged in a turbulent boundary layer, in *Proceedings of the 2nd Urban Air Quality Conference, Madrid, March 1999*.
- Steggel, N. and Castro, I.P. (1998) Effects of stable stratification on flow behind a two-dimensional fence submerged in a turbulent boundary layer, in *Advances in Turbulence VII, ed. U. Frisch, Kluwer Academic Publishers, pp487-490*.
- Steggel, N. and Rockliff, N.R. (1997) Simulation of the effects of body shape on lock-in characteristics in pulsating flow by the discrete vortex method, *Journal of Wind Engineering and Industrial Aerodynamics*, **69-71**, pp317-329.
- Steggel, N., Rockliff, N.R. and Castro, I.P. (1995) Numerical simulation of in-line oscillatory flow past square cylinders by the discrete vortex method, in *Proceedings of the Symposium on Fluid-Structure Interactions, presented at the International Mechanical Engineering Congress of the ASME, San Francisco, November 1995, pp25-35*.

Secondary author

- Robins, A.R., Castro, I.P., Hayden, P., Steggel, N., Contini, D. and Heist, D. (2001) A wind tunnel study of dense gas dispersion in a neutral boundary layer over a rough surface, *Atmospheric Environment*, **35**, 2243-2252.
- Robins, A.R., Castro, I.P., Hayden, P., Steggel, N., Contini, D., Heist, D. and Taylor, T.J. (2001) A wind tunnel study of dense gas dispersion in a stable boundary layer over a rough surface, *Atmospheric Environment*, **35**, 2253-2263.
- Robins, A.R., Castro, I.P., Steggel, N., Hayden, P. and Contini, D. (1998) Dense gas dispersion under neutral and stable ambient conditions, *EnFlo Internal Reports, EnFlo/PERF nos.15-20*.
- Rockliff, N.R. and Steggel, N. (1998) The effect of afterbody geometry on the vortex-shedding characteristics of bluff bodies, in *Proceedings of the 13th Australasian Fluid Mechanics Conference, Melbourne, December 1998*.