

Refereed Publications

55. **Shapiro, A.**, and E. Fedorovich, 2009: Analytical description of a nocturnal low-level jet. *Q. J. Roy. Met. Soc.*, (in review)
54. Schenkman, A., M. Xue, **A. Shapiro**, K. Brewster and J. Gao, 2009: Storm-scale data assimilation for the analysis and prediction of a tornadic convective system: the impact of high-resolution X-band radar data. *Mon. Wea. Rev.* (in review)
53. Axelson, S. L., **A. Shapiro**, E. Fedorovich, and H. van Dop, 2009: Analytical solution for katabatic flow induced by an isolated cold strip. *Env. Fluid Mech.* (in review)
52. Fedorovich, E. and **A. Shapiro**, 2009: Turbulent natural convection along a vertical plate immersed in a stably stratified fluid. *J. Fluid Mech.* (accepted)
51. **Shapiro, A.**, and E. Fedorovich, 2009: Nocturnal low-level jet over a shallow slope, *Acta Geophysica* (accepted)
50. Burkholder, B., **A. Shapiro**, and E. Fedorovich, 2009: Katabatic flow induced by a cross-slope band of surface cooling. *Acta Geophysica* (accepted)
49. Fedorovich, E., and **A. Shapiro**, 2009: Structure of numerically simulated katabatic and anabatic flows along steep slopes. *Acta Geophysica* (accepted)
48. Fedorovich, E., and **A. Shapiro**, 2009: Turbulence and waves in numerically simulated slope flows. *Mécanique et Industries* (accepted)
47. **Shapiro, A.**, C. K. Potvin, and J. Gao, 2009: Use of a vertical vorticity equation in variational dual-Doppler wind analysis, *J. Atmos. Oceanic Technol.*, (accepted)
46. **Shapiro, A.**, P. M. Klein, S. C. Arms, D. Bodine and M. Carney, 2009: The Lake Thunderbird Micronet Project, *Bull. Amer. Meteor. Soc.*, **90**, 811-823.
45. Potvin, C. K., **A. Shapiro**, T.-Y. Yu, J. Gao and M. Xue, 2009: Using a low-order model to detect and characterize tornadoes in multiple-Doppler radar data. *Mon. Wea. Rev.*, **137**, 1230-1249.
44. Bodine, D., P. M. Klein, S. C. Arms, and **A. Shapiro**, 2009: Variability of surface air temperature over gently-sloped terrain. *J. Appl. Meteor. Climatol.*, **48**, 1117-1141.
43. Wang, Y., T.-Y. Yu, M. Yearly, **A. Shapiro**, S. Nemati, M. Foster, D. L. Andra, Jr. and M. Jain, 2008: Tornado detection using a neuro-fuzzy system to integrate shear and spectral signatures. *J. Atmos. and Oceanic Technol.*, **25**, 1136-1148.
42. White, L., **A. Shapiro**, and F. White, 2008: Radar placement based on a geometric uncertainty multiplier reduction criterion. *Computational Optimization and Applications*, **41**, 61-80.
41. **Shapiro, A.**, and E. Fedorovich, 2008: Coriolis effects in homogeneous and inhomogeneous katabatic flows. *Q. J. Roy. Met. Soc.*, **134**, 353-370.
40. **Shapiro, A.**, and E. Fedorovich, 2007: Katabatic flow along a differentially-cooled sloping surface. *J. Fluid Mech.*, **571**, 149-175.

39. Zrníc, D. S., J. F. Kimpel, D. E. Forsyth, **A. Shapiro**, G. Crain, R. Ferek, J. Heimmer, W. Benner, T. J. McNellis, and R. J. Vogt, 2007: Agile beam phased array radar for weather observations. *Bull. Amer. Meteor. Soc.*, **88**, 1753-1766.
38. Yu, T.-Y., Y. Wang, **A. Shapiro**, M. Yeary, D. Zrníc, and R. J. Doviak, 2007: Characterization of tornado spectral signatures using higher order spectra. *J. Atmos. and Oceanic Technol.*, **24**, 1997-2013.
37. White, L., and **A. Shapiro**, 2007: Radar network scanning coordination based on ensemble transform Kalman filtering variance optimization. *Applied Mathematics and Computation*, **188**, 1285-1309.
36. White, L., and **A. Shapiro**, 2007: Optimization of radar scanning strategies using an ensemble relative error criterion. *Applied Mathematics and Computation*, **188**, 693-712.
35. Martin, W. J., and **A. Shapiro**, 2007: Discrimination of bird and insect radar echoes in clear-air using high-resolution radars. *J. Atmos. and Oceanic Technol.*, **24**, 1215-1230.
34. Yeary, M., Y. Zhai, T.-Y. Yu, S. Nematifar, and **A. Shapiro**, 2006: Spectral calculations and target tracking for remote sensing, *IEEE Transactions on Instrumentation and Measurement*, **55**, (4), 1430-1442.
33. Gao, J., M. Xue, S.-Y. Lee, **A. Shapiro**, Q. Xu, and K. K. Droegemeier, 2006: A three-dimensional variational single-Doppler velocity retrieval method with simple conservation equation constraint. *Meteorology and Atmos. Physics*, **94**, 11-26.
32. **Shapiro, A.**, 2006: An analytical solution of the Navier-Stokes equations for unsteady backward stagnation-point flow with injection or suction. *J. Appl. Math. Mech. (ZAMM)* **86**, 281-290.
31. **Shapiro, A.**, and E. Fedorovich, 2006: Natural convection in a stably stratified fluid along vertical plates and cylinders with temporally-periodic surface temperature variations. *J. Fluid Mech.*, **546**, 295-311.
30. White, L., and **A. Shapiro**, 2005: Optimization of wind field retrieval procedures. *Applied Mathematics and Computation*, **171**, 25-52.
29. **Shapiro, A.**, 2005: Drag-induced transfer of horizontal momentum between air and raindrops. *J. Atmos. Sci.*, **62**, 2205-2219.
28. Martin, W. J., and **A. Shapiro**, 2005: Impact of radar tilt and ground clutter on wind measurements in clear air. *J. Atmos. and Oceanic Technol.*, **22**, 649-663.
27. **Shapiro, A.**, and E. Fedorovich, 2005: Analytical and numerical study of natural convection in a stably stratified fluid along vertical plates and cylinders with temporally-periodic surface temperature variations. *Progress in Computational Heat and Mass Transfers*, Vol. 1, R. Bennacer, A. A. Mohamad, M. El Ganaoui, J. Sicard, Eds., Lavoisier, 77-82.
26. **Shapiro, A.**, and E. Fedorovich, 2004: Prandtl number dependence of unsteady natural convection along a vertical plate in a stably stratified fluid. *Intl. J. Heat Mass Transfer*, **47**, 4911-4927.

25. **Shapiro, A.**, and E. Fedorovich, 2004: Unsteady convectively driven flow along a vertical plate immersed in a stably stratified fluid. *J. Fluid Mech.*, **498**, 333-352.
24. **Shapiro, A.**, P. Robinson, J. Wurman, and J. Gao, 2003: Single-Doppler velocity retrieval with rapid scan radar data. *J. Atmos. and Oceanic Technol.*, **20**, 1758-1775.
23. Dowell, D. C., and **A. Shapiro**, 2003: Stability of an iterative dual-Doppler wind synthesis in Cartesian coordinates. *J. Atmos. and Oceanic Technol.*, **20**, 1552-1559.
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21. Mewes, J. J., and **A. Shapiro**, 2002: On use of the vorticity equation in dual-Doppler analysis of the vertical velocity field. *J. Atmos. and Oceanic Technol.*, **19**, 543-567.
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16. **Shapiro, A.**, 2001: Flow of an inviscid rotating liquid into an elevated sink. *Quart. J. Mech. Appl. Math.*, **54**, 243-256.
15. Lazarus, S., **A. Shapiro**, and K. Droegemeier, 2001: An application of the Gal-Chen/Zhang single-Doppler velocity retrieval to a deep convective storm. *J. Atmos. Sci.*, **58**, 998-1016.
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13. Gao, J., M. Xue, **A. Shapiro**, Q. Xu, and K. K. Droegemeier, 2001: Three-dimensional simple adjoint velocity retrievals from single Doppler radar, *J. Atmos. and Oceanic Technol.*, **18**, 26-38.
12. **Shapiro, A.**, and J. Mewes, 1999: New formulations of dual-Doppler wind analysis. *J. Atmos. and Oceanic Technol.*, **16**, 782-792.
11. **Shapiro, A.**, and P. Markowski, 1999: Dynamics of elevated vortices. *J. Atmos. Sci.*, **56**, 1101-1122.
10. Gao, J., M. Xue, **A. Shapiro**, and K. K. Droegemeier, 1999: A variational method for the analysis of three-dimensional wind fields from two Doppler radars. *Mon. Wea. Rev.*,

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8. **Shapiro, A.**, 1996: Nonlinear shallow-water oscillations in a parabolic channel: exact solutions and trajectory analyses. *J. Fluid Mech.*, **318**, 49-76.
7. Kogan, Y. L., and **A. Shapiro**, 1996: The simulation of a convective cloud in a 3-D model with explicit microphysics. Part II: Dynamical and microphysical aspects of cloud merger. *J. Atmos. Sci.*, **53**, 2525-2545.
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4. **Shapiro, A.**, 1993: The use of an exact solution of the Navier-Stokes equations in a validation test of a three-dimensional non-hydrostatic numerical model. *Mon. Wea. Rev.*, **121**, 2420-2425.
3. **Shapiro, A.**, 1992: A hydrodynamical model of shear flow over semi-infinite barriers with application to density currents. *J. Atmos. Sci.*, **49**, 2293-2305.
2. Steppeler, J., and **A. Shapiro**, 1990: Parameterization of physical processes in a three component model. *Meteorol. Rdsch.*, **43**, 17-22.
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