

Gerard J. Kluitenberg

Curriculum Vitae

CURRENT POSITION

Professor of Soil Physics
Department of Agronomy
2004 Throckmorton Hall
Kansas State University
Manhattan, KS 66506

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EDUCATION

Ph.D., 1989, Iowa State University, Agronomy (Soil Physics)
M.S., 1984, University of California, Davis, Water Science
B.S., 1982, University of California, Davis, Soil and Water Science

PROFESSIONAL EXPERIENCE

2001-present Professor, Department of Agronomy, Kansas State University
1995-2001 Associate Professor, Department of Agronomy, Kansas State University
1989-1995 Assistant Professor, Department of Agronomy, Kansas State University
1985-1989 USDA National Needs Fellow, Department of Agronomy, Iowa State University
1984-1985 Post-Graduate Researcher, Department of Land, Air and Water Resources, UC Davis
1983-1984 Graduate Research Assistant, Department of Land, Air and Water Resources, UC Davis

PROFESSIONAL AND HONORARY SOCIETIES

Soil Science Society of America
International Union of Soil Science
American Society of Agronomy
American Geophysical Union
Geological Society of America
Gamma Sigma Delta
Phi Kappa Phi

RESEARCH EXPERTISE AND INTERESTS

Thermal sensors for quantifying soil physical properties and processes; transport and fate of agricultural chemicals in soil; field-scale spatial variability of soil properties and transport processes; heat, radiation and energy exchange in the soil-plant-atmosphere continuum.

CURRENT TEACHING RESPONSIBILITIES

AGRON 816, Soil Physics (3 credits, even years) – Graduate course on the transport of water, solutes, gases, and heat in soil with both agricultural and engineering applications.
AGRON 916, Advanced Soil Physics (3 credits, odd years) – Graduate course that provides an advanced theoretical treatment of water, solute, and heat transfer processes in soil.

GRADUATE STUDENT ADVISING

Currently co-advising one M.S. student; four Ph.D. and four M.S. students completed; have served on graduate committee for 29 Ph.D. and 22 M.S. students; outside chair for 12 dissertation defenses.

HONORS AND AWARDS

Honorable Mention Paper Award, American Society of Agricultural and Biological Engineers (2008)
Outstanding Research Award, Gamma Sigma Delta, KSU Chapter (2008)
Editor's Citation for Excellence in Manuscript Review, Soil Science Society of America (2007)
Professorial Performance Award, Kansas State University (2007)
Making a Difference Award, K-State Women in Engineering and Science Program (2005)
Fellow, Soil Science Society of America (2003)
Fellow, American Society of Agronomy (2002)
Fellowship for Research in Japan, Japan Society for the Promotion of Science (1996)
Editor's Citation for Excellence in Manuscript Review, Soil Science Society of America (1990)

SELECTED PROFESSIONAL ACTIVITIES

Chair, Division S-1 (Soil Physics), Soil Science Society of America (2004-2005)
Chair (with P. A. Ferré) of symposium: *Physical Measurements in the Soil-Plant-Atmosphere System: Advances in Measurements at and Below the Ground Surface – A Tribute to Clarke Topp*, ASA/CSSA/SSSA Annual Meeting, November 10-14, 2002, Indianapolis, IN.
Guest Editor (with P.A. Ferré) for *Advances in Measurement and Monitoring Methods*, special section in *Vadose Zone Journal* 2(4):443-654, November 2003.
Chair (with M.B. Kirkham) of workshop: *Regionalized Variable Analysis Applicable to Soil Science and Agroecology Field Research*, K-State Research and Extension, Agrilience, and USDA-ARS Wind Erosion Research Unit, May 17-18, 2000, Manhattan, KS.
Associate Editor, *Soil Science Society of America Journal* (1994-1995)
Review Panel, Water Resources Assessment and Protection Area, USDA/CSRS National Research Initiative Competitive Grants Program, 1995, Washington, D.C.
Session Chair, Division S-1 (Soil Physics), Soil Science Society of America (1991, 1993, 1995, 2006)
Chair, Western Regional Technical Committee W-155 (1992)

SELECTED RECENT FUNDING

Kluitenberg, G.J. Evaluation of a Pedotransfer Function Approach for Estimation of Saturated Hydraulic Conductivity. National Resources Conservation Service, \$47,266, 2004-2005.
Hopmans, J.W., G.B. Pasternack, B.D. Shaw, K.L. Bristow, G.J. Kluitenberg, Y. Mori, and J. Simunek. Development of Multi-Functional Heat Pulse Probes for Ecological and Hydrologic Monitoring of Plant Root Zones. NSF Program for Biocomplexity in the Environment: Instrumentation Development for Environmental Activities, \$1,594,807 (KSU Subcontract \$180,334), 2004-2008.
Butler, J.J., Jr., G.J. Kluitenberg, and D.O. Whittemore. Field Assessment of a Method for Estimation of Ground-Water Consumption by Phreatophytes. Kansas Water Resources Research Institute, \$106,637 (\$40,754 KSU Subcontracts), 2003-2008.
Steinberg, S.L., J.I.D. Alexander, N.E. Daidzic, S.B. Jones, G.J. Kluitenberg, D. Or, L.N. Reddi, and M. Tuller. Flow and Distribution of Fluid Phases Through Porous Plant Growth Media in Microgravity. NASA Advanced Human Support Technology Program, \$1,554,554 (KSU Subcontract \$278,049), 2002-2005.
Kluitenberg, G.J., L.R. Stone, W.B. Gordon, and A.J. Schlegel. Nitrogen Management Strategies to Limit Subsurface Losses in Irrigated Corn Production. Kansas Fertilizer Research Fund Competitive Grants Program, \$52,834, 2002-2004.

SELECTED RECENT PUBLICATIONS

- Knight, J.H., G.J. Kluitenberg, T. Kamai, and J.W. Hopmans. 2012. A semi-analytical solution for the dual-probe heat-pulse method that accounts for the finite radius and finite heat capacity of the probes. *Vadose Zone J.* (in press).
- Jury, W.A., D. Or, Y. Pachepsky, H. Vereecken, J.W. Hopmans, L.R. Ahuja, B.E. Clothier, K.L. Bristow, G.J. Kluitenberg, P. Moldrup, J. Šimůnek, M.Th. van Genuchten, and R. Horton. 2011. Kirkham's legacy and contemporary challenges in soil physics research. *Soil Sci. Soc. Am J.* 75:1589-1601.
- Buckley, M.E., G.J. Kluitenberg, D.W. Sweeney, K.W. Kelley, and L.R. Stone. 2010. Effect of tillage on the hydrology of a claypan soil in Kansas. *Soil Sci. Soc. Am. J.* 74:2109-2119.
- Kluitenberg, G.J., T. Kamai, J.A. Vrugt, and J.W. Hopmans. 2010. Effect of probe deflection on dual-probe heat-pulse thermal conductivity measurements. *Soil Sci. Soc. Am. J.* 74:1537-1540.
- Kamai, T., A. Tuli, G. J. Kluitenberg, and J. W. Hopmans. 2010. Correction to "Soil water flux density measurements near 1 cm d⁻¹ using an improved heat pulse probe design." *Water Resour. Res.* 46:W07901, doi:10.1029/2010WR009423.
- Nippert, J.B., J.J. Butler, Jr., G.J. Kluitenberg, D.O. Whittemore, D. Arnold, S.E. Spal, and J.K. Ward. 2010. Patterns of *Tamarix* water use during a record drought. *Oecologia* 162:283-292.
- Kamai, T., G.J. Kluitenberg, and J.W. Hopmans. 2009. Design and numerical analysis of a button heat pulse probe for soil water content measurement. *Vadose Zone J.* 8:167-173.
- Kamai, T., A. Tuli, G.J. Kluitenberg, and J.W. Hopmans. 2008. Soil water flux density measurements near 1 cm d⁻¹ using an improved heat pulse probe design. *Water Resour. Res.* 44:W00D14, doi:10.1029/2008WR007036.
- Lee, K. H., N. Zhang, W.B. Kuhn, and G.J. Kluitenberg. 2007. A frequency-response permittivity sensor for simultaneous measurement of multiple soil properties: Part I. The frequency-response method. *Trans. ASABE* 50:2315-2326.
- Knight, J.H., W. Jin, and G.J. Kluitenberg. 2007. Sensitivity of the dual-probe heat-pulse method to spatial variations in heat capacity and water content. *Vadose Zone J.* 6:746-758.
- Butler, J.J., Jr., G.J. Kluitenberg, D.O. Whittemore, S.P. Loheide, II, W. Jin, M.A. Billinger, and X. Zhan. 2007. A field investigation of phreatophyte-induced fluctuations in the water table. *Water Resour. Res.* 43:W02404, doi:10.1029/2005WR004627.
- Kluitenberg, G.J., T.E. Ochsner, and R. Horton. 2007. Improved analysis of heat pulse signals for soil water flux determination. *Soil Sci. Soc. Am. J.* 71:53-55.
- Valente, A., R. Morais, A. Tuli, J.W. Hopmans, and G.J. Kluitenberg. 2006. Multi-functional probe for small-scale simultaneous measurements of soil thermal properties, water content, and electrical conductivity. *Sensors & Actuators A: Physical* 132:70-77.
- Heinse, R., K.S. Lewis, S.B. Jones, G. Kluitenberg, R.S. Austin, P.J. Shouse, and G.E. Bingham. 2006. Integration of heat capacity and electrical conductivity sensors for root module water and nutrient assessment. SAE Paper No. 2006-01-2211. 36th International Conference on Environmental Systems (ICES), Norfolk, VA. July 17-20, 2006.
- Steinberg, S.L., G.J. Kluitenberg, S.B. Jones, N.E. Diadzic, L.N. Reddi, M. Xiao, M. Tuller, R.M. Newman, D. Or, and J.I.D. Alexander. 2005. Physical and hydraulic properties of baked ceramic aggregates used for plant growth medium. *J. Am. Soc. Hort. Sci.* 130:767-774.
- Knight, J.H., and G.J. Kluitenberg. 2005. Analytical solutions for sensitivity of well tests to variations in storativity and transmissivity. *Adv. Water Resour.* 28:1057-1075.
- Das, B.S., J.M. Wraith, G.J. Kluitenberg, H.M. Langner, P.J. Shouse, and W.P. Inskeep. 2005. Evaluation of mass recovery impacts on transport parameters using least-squares optimization and moment analysis. *Soil Sci. Soc. Am. J.* 69:1209-1216.
- Ochsner, T.E., R. Horton, G.J. Kluitenberg, and Q. Wang. 2005. Evaluation of the heat pulse ratio method for measuring soil water flux. *Soil Sci. Soc. Am. J.* 69: 757-765.
- Mori, Y., J.W. Hopmans, A.P. Mortensen, and G.J. Kluitenberg. 2005. Estimation of vadose zone water flux from multi-functional heat pulse probe measurements. *Soil Sci. Soc. Am. J.* 69:599-606.

- Newman, R.M., G.J. Kluitenberg, and S.L. Steinberg. 2005. Evaluation of the dual-probe heat-pulse method for measuring water content in spaceflight plant growth systems. SAE Paper No. 2005-01-2951. 35th International Conference on Environmental Systems (ICES) and 8th European Symposium on Space Environmental Control Systems (ESSECS), Rome, Italy. July 11-14, 2005.
- Steinberg, S.L., S.B. Jones, M. Xiao, L. Reddi, G. Kluitenberg, D. Or, J.I.D. Alexander, N. Daidzic, and M. Tuller. 2005. Challenges to understanding fluid behavior in plant growth media under microgravity. SAE Paper No. 2005-01-2947. 35th International Conference on Environmental Systems (ICES) and 8th European Symposium on Space Environmental Control Systems (ESSECS), Rome, Italy. July 11-14, 2005.
- Presley, D.R., M.D. Ransom, G.J. Kluitenberg, and P.R. Finnell. 2004. Effects of thirty years of irrigation on the genesis and morphology of two semiarid soils in Kansas. *Soil Sci. Soc. Am. J.* 68:1916-1926.
- Kluitenberg, G.J., and J.M. Ham. 2004. Improved theory for calculating sap flow with the heat pulse method. *Agric. For. Meteorol.* 126:169-173.
- Zhang, N., G. Fan, K.H. Lee, G.J. Kluitenberg, and T.M. Loughin. 2004. Simultaneous measurement of soil water content and salinity using a frequency-response method. *Soil Sci. Soc. Am. J.* 68:1515-1525.
- Pierzynski, G.M., J.L. Heitman, P.A. Kulakow, G.J. Kluitenberg, and J. Carlson. 2004. Revegetation of waste fly ash landfills in a semiarid environment. *J. Range Manage.* 57:312-319.
- Knight, J.H., and G.J. Kluitenberg. 2004. Simplified computational approach for dual-probe heat-pulse method. *Soil Sci. Soc. Am. J.* 68:447-449.
- Lee, K.H., N. Zhang, G. Kluitenberg, W.B. Kuhn, and S. Das. 2004. A dielectric permittivity sensor for simultaneous measurement of multiple soil properties. ASAE/CSAE Paper No. 041045. Annual International Meeting, Ottawa, Ontario. American Society of Agricultural Engineers and Canadian Society of Agricultural Engineering.
- Mori, Y., J.W. Hopmans, A.P. Mortensen, and G.J. Kluitenberg. 2003. Multi-functional heat pulse probe for the simultaneous measurement of soil water content, solute concentration, and heat transport parameters. *Vadose Zone J.* 2:561-571.
- Heitman, J.L., J.M. Basinger, G.J. Kluitenberg, J.M. Ham, J.M. Frank, and P.L. Barnes. 2003. Field evaluation of the dual-probe heat-pulse method for measuring soil water content. *Vadose Zone J.* 2:552-560.
- Basinger, J.M., G.J. Kluitenberg, J.M. Ham, J.M. Frank, P.L. Barnes, and M.B. Kirkham. 2003. Laboratory evaluation of the dual-probe heat-pulse method for measuring soil water content. *Vadose Zone J.* 2:389-399.
- Wu, J., M.D. Ransom, M.D. Nellis, G.J. Kluitenberg, H.L. Seyler, and B.C. Rundquist. 2002. Using GIS to assess and manage the conservation reserve program in Finney County, Kansas. *Photogrammetric Engineering & Remote Sensing* 68:735-744.
- Das, B.S., R.S. Govindaraju, G.J. Kluitenberg, A. J. Valocchi, and J.M. Wraith. 2002. Theory and applications of time moment analysis to study the fate of reactive solutes in soil. p. 239-279. *In* R.S. Govindaraju (ed.) *Stochastic methods in subsurface contaminant hydrology*. ASCE Press. American Society of Civil Engineers, Reston, VA.
- Kluitenberg, G.J., and J.L. Heitman. 2002. Effect of forced convection on soil water content measurement with the dual-probe heat-pulse method. p. 275-283. *In* P.A.C. Raats et al. (ed.) *Environmental mechanics: Water, mass and energy transfer in the biosphere*. Geophysical Monograph Series, Vol. 129, American Geophysical Union, Washington, DC.
- Kluitenberg, G.J. 2002. Heat capacity and specific heat. p. 1201-1208. *In* J.H. Dane and G.C. Topp (ed.) *Methods of soil analysis*. Part 4. SSSA Book Ser. 5. SSSA and ASA, Madison, WI.
- Steinberg, S.L., N.E. Daidzic, S. Jones, D. Or, G. Kluitenberg, L. Reddi, J.I.D. Alexander, and M. Tuller. 2002. Flow and distribution of fluid phases through porous plant growth media in microgravity: Progress to date. SAE Paper No. 2002-01-2386. 32nd International Conference on Environmental Systems (ICES), San Antonio, TX. July 15-18, 2002.