



Professor Richard Wiebe

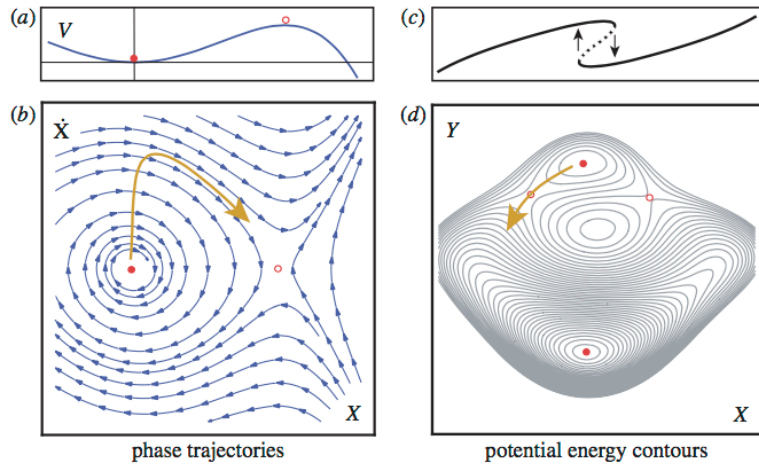


Figure 1. A schematic visualization. (a) A potential energy function, (b) the corresponding phase portrait, (c) hysteresis in an equilibrium path and (d) a two-dimensional potential energy contour plot. (Online version in colour.)

From: R. Wiebe and L.N. Virgin, “On the experimental identification of unstable static equilibria”, Proceedings of The Royal Society A: Mathematical Physical and Engineering Sciences, Vol. 472, 20160172, June 2016

See:

- <https://www.ce.washington.edu/facultyfinder/richard-wiebe>
- <https://scholar.google.com/citations?user=ayi4E1gAAAAJ&hl=en>
- https://www.researchgate.net/profile/Richard_Wiebe2
- <https://www.linkedin.com/in/r2wiebe>

Department of Civil and Environmental Engineering
University of Washington, Seattle, Washington, USA

Biography:

Richard Wiebe joined the Department of Civil and Environmental Engineering in 2014 after working at the Air Force Research Laboratory where he investigated the nonlinear dynamics of aerospace structures. Prior to this, Richard received his Ph.D. from Duke University in December 2012, his Master's at the University of Waterloo in 2009, and his Bachelor's in 2007 from Lakehead University, all in Civil Engineering.

Research Interests:

Richard's research is focused on nonlinear structural dynamics of civil, mechanical, and aerospace structures. His work utilizes both numerical and experimental methods to improve the efficiency of these systems. Applications include analysis of structural response in extreme environments (e.g. seismic, blast, high-speed aircraft), buckling and stability of slender structures, and applications in marine turbines.

Selected Publications:

R. Wiebe and L. N. Virgin, “On the identification of chaos from frequency content,” in Proceedings of the 2011 ASME IDETC/CIE Conference, Washington DC, August (2011).

Wiebe R. 2012 Nonlinear dynamics of discrete and continuous mechanical systems with snap-through instabilities. PhD dissertation, Duke University, NC.

R. Wiebe, L. N. Virgin, and T. P. Witelski, "A parametrically forced nonlinear system with reversible equilibria," *Int. J. Bifurcation Chaos* (in press).

R. Wiebe and L.N. Virgin, "A heuristic method for identifying chaos from frequency content", *AIP, Chaos-An Interdisciplinary Journal of Nonlinear Science*, Vol. 22, 013136, 2012

Virgin LN, Wiebe R. 2013. On damping in the vicinity of critical points. *Phil. Trans. R. Soc. A* 371, 20120426.

Yenny Chandra, Richard Wiebe, Ilinca Stanciulescu, Lawrence N. Virgin, Stephen M. Spottswood and Thomas G. Eason, "Characterizing dynamic transitions associated with snap-through of clamped shallow arches", *Journal of Sound and Vibration*, Vol. 332, No. 22, pp 5837-5855, October 2013

Wiebe, R., Virgin, L. N., Stanciulescu, I., Spottswood, S. M. & Eason, T. G. [2013] "Characterizing dynamic transitions associated with snap-through: A discrete system," *J. Comput. Nonlin. Dyn.* 8, doi: 10.1115/1.4006201.

Wiebe, R., Spottswood, S.M.: Complex behavior of a buckled beam under combined harmonic and random loading. *Nonlinear Dyn. Springer Int. Publ.* 2, 11–18 (2014)

L. Virgin, R. Wiebe, S. Spottswood, T. Eason, Sensitivity in the structural behavior of shallow arches, *International Journal of Non-Linear Mechanics* 58 (2014) 212–221.

J.J. Waite, L.N. Virgin and R. Wiebe, "Competing responses in a discrete mechanical system", *International Journal of Bifurcation and Chaos*, Vol. 24, No. 2, 1430003, 2014

Wiebe, R., Spottswood, S.M.: Co-existing responses and stochastic resonance in post-buckled structures: a combined numerical and experimental study. *J. Sound Vib.* 333, 4682– 4694 (2014)

R. Wiebe, I. Stanciulescu, Inconsistent Stability of Newmark's Method in Structural Dynamics Applications, *Journal of Computational and Nonlinear Dynamics* 10 (5) (2015) 051006.

R. Wiebe and D. Ehrhardt, "Experimental Nonlinear Dynamics and Chaos of Post-buckled Plates", Chapter in *Proceedings of the 33rd IMAC, A Conference and Exposition on Structural Dynamics*, Edited by Gaetan Kerschen, 2016

R. Wiebe and L.N. Virgin, "On the experimental identification of unstable static equilibria", *Proceedings of The Royal Society A: Mathematical Physical and Engineering Sciences*, Vol. 472, 20160172, June 2016

R. Wiebe and S.M. Spottswood, "On the dimension of complex responses in nonlinear structural vibrations", *Journal of Sound and Vibration*, Vol. 373, pp 192-204, July 2016

L.N. Virgin, R. Wiebe, S.M. Spottswood and T. Bebernis, "Inferring unstable equilibrium configurations from experimental data", *Journal of Physics: Conference Series*, Vol. 744, 012090, 2016 (MOVIC2016 & RASD2016, IOP Publishing)

R. Wiebe, R.A. Perez and S.M. Spottswood, "Robust simulation of buckled structures using reduced order modeling", *Journal of Physics: Conference Series*, Vol. 744, 012118, 2016 (MOVIC2016 & RASD2016, IOP Publishing)

R. Wiebe and S.M. Spottswood, "On the Response Dimension of Nonlinear Structural Vibrations", *Journal of Sound and Vibration* (in review).

Han-Gyu Kim and Richard Wiebe, "Experimental and numerical investigation of nonlinear dynamics and snap-through boundaries of post-buckled laminated composite plates", *Journal of Sound and Vibration*, Vol. 439, pp 362-387, 20 January 2019