Stanford



Eric Dunham

Professor of Geophysics

Bio

BIO

My research focuses on the development and use of physics-based computational simulations to characterize and understand earthquakes, tsunamis, and volcanoes, and similar phenomena. My approach is to identify the fundamental mechanical processes governing a system of interest, develop numerical models incorporating these processes, validate them using geophysical observations, and then use the models to predict system behavior. Specific research areas include earthquake rupture dynamics and earthquake source processes, tsunami generation, volcano seismology and infrasound, ice stream stick-slip events and flexural-gravity waves in ice shelves, and numerical methods for wave propagation.

ACADEMIC APPOINTMENTS

- Professor, Geophysics
- Member, Institute for Computational and Mathematical Engineering (ICME)

ADMINISTRATIVE APPOINTMENTS

- Reginald A. Daly Postdoctoral Fellow, Department of Earth and Planetary Sciences, Harvard University, (2005-2007)
- Research Associate in Geophysics, Department of Earth and Planetary Sciences, Harvard University, (2007-2009)
- Lecturer on Applied Mathematics, School of Engineering and Applied Sciences, Harvard University, (2008-2009)
- Assistant Professor, Department of Geophysics, Stanford University, (2009- present)
- Affiliated Faculty Member, Institute for Computational and Mathematical Engineering, Stanford University, (2011- present)

HONORS AND AWARDS

- Jefferson Scholar, University of Virginia (1996-2000)
- Member, Phi Beta Kappa (1999)
- B.S. Physics with Highest Distinction, University of Virginia (2000)
- Parsons Fellow in computational science, University of California, Santa Barbara, Physics (2000)
- James W. Elkins Award, University of Virginia Physics (2000)
- John Cardy Award, UCSB Physics (2001)
- Graduate Fellow, National Defense Science and Engineering (2001-2005)
- Outstanding Student Paper, American Geophysical Union (2002)
- UCSB Affiliates Graduate Dissertation Fellowship, University of California, Santa Barbara (2004)
- Outstanding Student Paper, American Geophysical Union (2004)
- Student Presentation Award, Seismological Society of America (2004)

- Editors' Citation for Excellence in Refereeing, Geophysical Research Letters (2007)
- Certificate of Distinction in Teaching, Harvard University (2008)
- Terman Fellow, Stanford University (2009-2012)
- Best Poster Award, Society of Industrial and Applied Mathematics (SIAM) Geosciences (2011)
- Fellow, Physics, Alfred P. Sloan Foundation (2012)
- NSF CAREER award on Subduction Zone Hazards: Megathrust Rupture Dynamics and Tsunamis, National Science Foundation (2013-2017)
- School of Earth Sciences Excellence in Teaching Award, Stanford University (2014)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Invited speaker, Stanford Club of Marin (2015 - 2015)
- Invited speaker for Stanford Admit Weekend, Academic Expo, Stanford University (2015 - 2015)
- Faculty search committee, member, Department of Geophysics, Stanford University (2014 - 2015)
- External Program review panel member, USGS-NEHRP (National Earthquake Hazards Reduction Program) (2014 - 2014)
- Invited speaker, Stanford Alumni Club of the Desert (2014 - 2014)
- Invited speaker, Southern California Earthquake Center (SCEC) Annual Meeting (2014 - 2014)
- Invited speaker, Incorporated Research Institutions for Seismology, Grand Challenges in Faulting and Deformation Processes (2014 - 2014)
- Invited speaker, American Geophysical Union Fall Meeting (two invited talks) (2014 - 2014)
- Invited speaker, Computational Infrastructure for Geodynamics Crustal Deformation Modeling Workshop (2014 - 2014)
- Invited speaker, Penn State (2014 - 2014)
- Invited speaker, Caltech (2014 - 2014)
- Invited speaker for Stanford Admit Weekend, Academic Expo, Stanford University (2014 - 2014)
- Invited speaker, Annual meeting, Seismological Society of America (2014 - 2014)
- Invited speaker, Rock and Fluid Physics: Academic and Industrial Perspectives Conference, Shell Technology Centre, Amsterdam (2014 - 2014)
- Geophysics Admissions Committee, Stanford University (2013 - 2014)
- School of Earth Sciences Teaching Task Force, Stanford University (2013 - 2014)
- Co-organizer for annual meeting special session on Earthquake Source Physics, Seismological Society of America (2013 - 2013)
- External Program review panel member, USGS-NEHRP (National Earthquake Hazards Reduction Program) (2013 - 2013)
- Invited speaker, King Abdullah University of Science and Technology (2013 - 2013)
- Invited speaker, University of British Columbia (2013 - 2013)
- Invited speaker, Lockheed Martin Advanced Technology Center (2013 - 2013)
- Invited speaker at New Student Orientation, Engaging with Faculty, Stanford University (2013 - 2013)
- Invited speaker for Stanford Admit Weekend, Academic Expo, Stanford University (2013 - 2013)
- Advisory Board, Computational Geosciences MS Program, Institute for Computational and Mathematical Engineering, Stanford Univeristy (2012 - present)
- Co-leader of Computational Science disciplinary group, member of Planning Committee, Southern California Earthquake Center (SCEC) (2012 - present)
- Chair, 5th Chinese-American Kavli Frontiers of Science Symposium, Earthquake Mechanics and Forecasting, National Academy of Sciences, (2012 - 2012)
- Co-organizer for annual meeting special session on Seismicity in Volcanic Environments, Seismological Society of America (2012 - 2012)
- Invited speaker at New Student Orientation, Engaging with Faculty, Stanford University (2012 - 2012)
- Invited speaker, Fall Meeting, American Geophysical Union (2012 - 2012)

- Invited speaker, New Perspective on Great Earthquakes Along Subduction Zones, International Conference (2012 - 2012)
- Stanford School of Earth Sciences Council, Stanford University (2011 - present)
- Geophysics Department Seminar Series Organizer, Stanford University (2011 - 2012)
- Co-organizer for Geosciences Minisymposium on Computational Challenges in Earthquake Simulation, Society for Industrial and Applied Mathematics (SIAM) (2011 - 2011)
- Invited speaker, University of California, Santa Cruz (2011 - 2011)
- Invited speaker at New Student Orientation, Engaging with Faculty, Stanford University (2011 - 2011)
- Invited speaker, Fall Meeting, American Geophysical Union (2011 - 2011)
- Undergraduate Premajor Advisor, Stanford University (2010 - present)
- Co-convener for International Workshop on Multiscale and Multiphysics Processes in Geomechanics, Stanford University (2010 - 2010)
- Delegate, Panel on Earthquake Research, U.S.-Japan Natural Resources (UJNR) (2010 - 2010)
- External Program review panel member, USGS-NEHRP (National Earthquake Hazards Reduction Program) (2010 - 2010)
- Invited speaker, Lawrence Livermore National Laboratory (2010 - 2010)
- Invited speaker, University of California, Berkeley, Seismological Laboratory (2010 - 2010)
- Invited speaker, University of Oregon (2010 - 2010)
- Invited speaker, Lockheed Martin Advanced Technology Center (2010 - 2010)
- Invited speaker, University of California, Berkeley, Applied Mathematics (2010 - 2010)
- Geophysics Undergraduate Curriculum Committee, Stanford University (2009 - 2010)
- Co-convener, Workshop on Dynamic Weakening Mechanisms, Southern California Earthquake Center (2009 - 2009)
- Co-organizer for earthquake rupture code validation project, Southern California Earthquake Center (2007 - 2011)
- Associate Editor, Journal of Geophysical Research-Solid Earth (2005 - 2008)

PROFESSIONAL EDUCATION

- Ph.D., University of California, Santa Barbara , Physics (2005)
- B.S., University of Virginia , Physics (2000)

LINKS

- Personal Website: http://pangea.stanford.edu/~edunham/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research

My research focuses on the development and use of physics-based computational simulations to characterize and understand earthquakes, tsunamis, and volcanoes, and similar phenomena. My approach is to identify the fundamental mechanical processes governing a system of interest, develop numerical models incorporating these processes, validate them using geophysical observations, and then use the models to predict system behavior. Specific research areas include earthquake rupture dynamics and earthquake source processes, tsunami generation, volcano seismology and infrasound, ice stream stick-slip events and flexural-gravity waves in ice shelves, and numerical methods for wave propagation.

Teaching

I teach courses on mechanics and modeling (GEOPHYS 120/220: Geophysical Mechanics and Dynamics), numerical methods (CME 108/MATH 114: Introduction to Scientific Computing), wave generation and propagation (GEOPHYS 238: Waves in Solids and Fluids), and earthquakes (GEOPHYS 229: Earthquake Rupture Dynamics).

Professional Awards

NSF CAREER award, 2013; Alfred P. Sloan Fellow in Physics, 2012

PROJECTS

- Collaborative Development of Numerical Methods for Wave Propagation - Stanford University and Uppsala University
- Villarica Volcano
- Antarctic Ice Shelves
- Kilauea Volcano
- 2011 Tohoku Earthquake and Tsunami

Teaching

COURSES

2026-27

- Earthquake Rupture Dynamics: GEOPHYS 229 (Win)
- Geophysical Mechanics and Dynamics: GEOPHYS 120, GEOPHYS 220 (Aut)
- Physical Volcanology: GEOPHYS 385R (Aut, Win, Spr)
- Theoretical Geophysics: GEOPHYS 385D (Aut, Win, Spr)

2025-26

- Geophysical Mechanics and Dynamics: GEOPHYS 120, GEOPHYS 220 (Aut)
- Physical Volcanology: GEOPHYS 385R (Aut, Win, Spr)
- Theoretical Geophysics: GEOPHYS 385D (Aut, Win, Spr)
- Waves in Solids and Fluids: GEOPHYS 238 (Win)

2024-25

- Earthquake Rupture Dynamics: GEOPHYS 229 (Aut)
- Physical Volcanology: GEOPHYS 385R (Aut, Win, Spr, Sum)
- Theoretical Geophysics: GEOPHYS 385D (Aut, Win, Spr, Sum)

2023-24

- Geophysical Mechanics and Dynamics: GEOPHYS 120, GEOPHYS 220 (Win)
- Physical Volcanology: GEOPHYS 385R (Aut, Win, Spr)
- Theoretical Geophysics: GEOPHYS 385D (Aut, Win, Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Becca Prentice, Joshua Rines, Yifan Yu

Postdoctoral Faculty Sponsor

Meng Li, Wenqiang Zhang

Doctoral Dissertation Advisor (AC)

Rikuto Fukushima, Satoshi Ito, Mario Ruiz Moreno

Doctoral (Program)

Natalia Berrios-Rivera, Rikuto Fukushima

Publications

PUBLICATIONS

- **Turbulent seismoacoustic imprints during a hurricane landfall.** *Science (New York, N.Y.)*
  Ji, Q., Dey, I., Dunham, E. M.
  2026; 393 (6811): 628-632
- **Nonsymmetric Seismic Moment Tensors and Seismic Torques: Theory and Application to Caldera Collapse Earthquakes at the Kilauea Volcano in 2018** *BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA*
  Wang, T. A., Dunham, E. M.
  2026; 116 (4): 1359-1382
- **The Cascadia Region Earthquake Science Center (CRESCENT): Advancing Understanding of Cascadia's Earthquake Hazards** *SEISMOLOGICAL RESEARCH LETTERS*
  Melgar, D., Thomas, A. M., Sahakian, V., Share, P., Meigs, A., Tobin, H., Staisch, L., Melbourne, T., Elizabeth, J., Ajala, R., Amos, C., Bachelot, L., Bennett, et al
  2026
- **Metamorphic Dehydration, Fluid Pressure, and the Frictional-Viscous Transition Along Subduction Megathrusts: Case Study in Cascadia and Implications for Slow Earthquakes** *AGU ADVANCES*
  Ozawa, S., Dunham, E. M., Condit, C. B.
  2026; 7 (3)
- **Fluid Pressure Diffusion and Elastic Stress Transfer From Seismic Slip Control Slip Front Expansion in Fluid-Driven Swarm Seismicity** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Berrios-rivera, N., Ozawa, S., Dunham, E. M.
  2025; 130 (12)
- **Community-Driven Code Comparisons for Simulations of Fluid-Induced Aseismic Slip** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Lambert, V. R., Erickson, B. A., Jiang, J., Dunham, E. M., Kim, T., Ampuero, J., Ando, R., Cappa, F., Dublanchet, P., Elbanna, A., Fialko, Y., Gabriel, A., Lapusta, et al
  2025; 130 (4)
- **Seismic Signatures of Fluctuating Fragmentation in Volcanic Eruptions** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Coppess, K. R., Lam, F. Y. K., Dunham, E. M.
  2025; 130 (1)
- **Adjoint-based inversion for stress and frictional parameters in earthquake modeling** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Stiernstrom, V., Almquist, M., Dunham, E. M.
  2024; 519
- **Fault-Valve Instability: A Mechanism for Slow Slip Events** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Ozawa, S., Yang, Y., Dunham, E. M.
  2024; 129 (10)
- **Fluid-driven aseismic fault slip with permeability enhancement and dilatancy.** *Philosophical transactions. Series A, Mathematical, physical, and engineering sciences*
  Dunham, E. M.
  2024; 382 (2276): 20230255
- **Dynamic Rupture Simulations of Caldera Collapse Earthquakes: Effects of Wave Radiation, Magma Viscosity, and Evidence of Complex Nucleation at Kilauea 2018** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*

Wang, T. A., Dunham, E. M., Krenz, L., Abrahams, L. S., Segall, P., Yoder, M. R.
2024; 129 (4)

- **Ambient noise from the atmosphere within the seismic hum period band: A case study of hurricane landfall** *Earth and Planetary Science Letters*
  Ji, Q., Dunham, E. M.
  2024; 629: 118589
- **Simulation of flexural-gravity wave propagation for elastic plates in shallow water using an energy-stable finite difference method with weakly enforced boundary and interface conditions** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Tazhimbetov, N., Almquist, M., Werpers, J., Dunham, E. M.
  2023; 493
- **Quantifying the probability of rupture arrest at restraining and releasing bends using earthquake sequence simulations** *EARTH AND PLANETARY SCIENCE LETTERS*
  Ozawa, S., Ando, R., Dunham, E. M.
  2023; 617
- **Modeling and inversion in acoustic-elastic coupled media using energy-stable summation-by-parts operators** *GEOPHYSICS*
  Bader, M., Almquist, M., Dunham, E. M.
  2023; 88 (3): T137-T150
- **Influence of port opening dynamics on the acoustic signature of pneumatic marine seismic sources** *GEOPHYSICS*
  Lam, F. Y. K., Dunham, E. M.
  2023; 88 (3): P15-P36
- **Influence of Creep Compaction and Dilatancy on Earthquake Sequences and Slow Slip** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Yang, Y., Dunham, E. M.
  2023; 128 (4)
- **Incorporating Full Elastodynamic Effects and Dipping Fault Geometries in Community Code Verification Exercises for Simulations of Earthquake Sequences and Aseismic Slip (SEAS)** *BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA*
  Erickson, B. A., Jiang, J., Lambert, V., Barbot, S. D., Abdelmeguid, M., Almquist, M., Ampuero, J., Ando, R., Cattania, C., Chen, A., Dal Zilio, L., Deng, S., Dunham, et al
  2023; 113 (2): 499-523
- **Comparison of methods for coupled earthquake and tsunami modelling** *GEOPHYSICAL JOURNAL INTERNATIONAL*
  Abrahams, L. S., Krenz, L., Dunham, E. M., Gabriel, A., Saito, T.
  2023; 234 (1): 404-426
- **Hindcasting injection-induced aseismic slip and microseismicity at the Cooper Basin Enhanced Geothermal Systems Project.** *Scientific reports*
  Wang, T. A., Dunham, E. M.
  2022; 12 (1): 19481
- **Models of Injection-Induced Aseismic Slip on Height-Bounded Faults in the Delaware Basin Constrain Fault-Zone Pore Pressure Changes and Permeability** *GEOPHYSICAL RESEARCH LETTERS*
  Dvory, N. Z., Yang, Y., Dunham, E. M.
  2022; 49 (11)
- **Ultra and Very Long Period Seismic Signatures of Unsteady Eruptions Predicted From Conduit Flow Models** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Coppess, K. R., Dunham, E. M., Almquist, M.
  2022; 127 (6)
- **Physics-Based Model Reconciles Caldera Collapse Induced Static and Dynamic Ground Motion: Application to Kilauea 2018** *GEOPHYSICAL RESEARCH LETTERS*
  Wang, T. A., Coppess, K. R., Segall, P., Dunham, E. M., Ellsworth, W.
  2022; 49 (8)

- **Community-Driven Code Comparisons for Three-Dimensional Dynamic Modeling of Sequences of Earthquakes and Aseismic Slip** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Jiang, J., Erickson, B. A., Lambert, V. R., Ampuero, J., Ando, R., Barbot, S. D., Cattania, C., Zilio, L., Duan, B., Dunham, E. M., Gabriel, A., Lapusta, N., Li, et al
  2022; 127 (3)
- **Infrasound Radiation From Impulsive Volcanic Eruptions: Nonlinear Aeroacoustic 2D Simulations** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Watson, L. M., Dunham, E. M., Mohaddes, D., Labahn, J., Jaravel, T., Ihme, M.
  2021; 126 (9)
- **Effect of Porosity and Permeability Evolution on Injection-Induced Aseismic Slip** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Yang, Y., Dunham, E. M.
  2021; 126 (7)
- **Influence of Shear Heating and Thermomechanical Coupling on Earthquake Sequences and the Brittle-Ductile Transition** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Allison, K. L., Dunham, E. M.
  2021; 126 (6)
- **Elastic wave propagation in anisotropic solids using energy-stable finite differences with weakly enforced boundary and interface conditions** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Almquist, M., Dunham, E. M.
  2021; 424
- **Earthquake Sequence Dynamics at the Interface Between an Elastic Layer and Underlying Half-Space in Antiplane Shear** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Abrahams, L. S., Allison, K. L., Dunham, E. M.
  2020; 125 (12)
- **Fault valving and pore pressure evolution in simulations of earthquake sequences and aseismic slip.** *Nature communications*
  Zhu, W., Allison, K. L., Dunham, E. M., Yang, Y.
  2020; 11 (1): 4833
- **Role of Fluid Injection on Earthquake Size in Dynamic Rupture Simulations on Rough Faults** *GEOPHYSICAL RESEARCH LETTERS*
  Maurer, J., Dunham, E. M., Segall, P.
  2020; 47 (13)
- **Non-stiff boundary and interface penalties for narrow-stencil finite difference approximations of the Laplacian on curvilinear multiblock grids** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Almquist, M., Dunham, E. M.
  2020; 408
- **Lava lake sloshing modes during the 2018 Kilauea Volcano eruption probe magma reservoir storativity** *EARTH AND PLANETARY SCIENCE LETTERS*
  Liang, C., Dunham, E. M.
  2020; 536
- **Influence of fault roughness on surface displacement: from numerical simulations to coseismic slip distributions** *GEOPHYSICAL JOURNAL INTERNATIONAL*
  Bruhat, L., Klinger, Y., Vallage, A., Dunham, E. M.
  2020; 220 (3): 1857–77
- **The Community Code Verification Exercise for Simulating Sequences of Earthquakes and Aseismic Slip (SEAS)** *SEISMOLOGICAL RESEARCH LETTERS*
  Erickson, B. A., Jiang, J., Barall, M., Lapusta, N., Dunham, E. M., Harris, R., Abrahams, L. S., Allison, K. L., Ampuero, J., Barbot, S., Cattania, C., Elbanna, A., Fialko, et al
  2020; 91 (2): 874–90
- **The State of Stress on the Fault Before, During, and After a Major Earthquake** *ANNUAL REVIEW OF EARTH AND PLANETARY SCIENCES, VOL 48, 2020*

Brodsky, E. E., Mori, J. J., Anderson, L., Chester, F. M., Conin, M., Dunham, E. M., Eguchi, N., Fulton, P. M., Hino, R., Hirose, T., Ikari, M. J., Ishikawa, T., Jeppson, et al
edited by Jeanloz, R., Freeman, K. H.
2020; 48: 49–74

- **Magma Oscillations in a Conduit-Reservoir System, Application to Very Long Period (VLP) Seismicity at Basaltic Volcanoes: 2. Data Inversion and Interpretation at Klauea Volcano** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Liang, C., Crozier, J., Karlstrom, L., Dunham, E. M.
  2020; 125 (1)
- **Magma Oscillations in a Conduit-Reservoir System, Application to Very Long Period (VLP) Seismicity at Basaltic Volcanoes: 1. Theory** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Liang, C., Karlstrom, L., Dunham, E. M.
  2020; 125 (1)
- **Dynamic rupture and earthquake sequence simulations using the wave equation in second-order form** *GEOPHYSICAL JOURNAL INTERNATIONAL*
  Duru, K., Allison, K. L., Rivet, M., Dunham, E. M.
  2019; 219 (2): 796–815
- **Fully Coupled Simulations of Megathrust Earthquakes and Tsunamis in the Japan Trench, Nankai Trough, and Cascadia Subduction Zone** *PURE AND APPLIED GEOPHYSICS*
  Lotto, G. C., Jeppson, T. N., Dunham, E. M.
  2019; 176 (9): 4009–41
- **Poroelastic effects destabilize mildly rate-strengthening friction to generate stable slow slip pulses** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Heimisson, E. R., Dunham, E. M., Almquist, M.
  2019; 130: 262–79
- **Simulation and inversion of harmonic infrasound from open-vent volcanoes using an efficient quasi-1D crater model** *JOURNAL OF VOLCANOLOGY AND GEOTHERMAL RESEARCH*
  Watson, L. M., Dunham, E. M., Johnson, J. B.
  2019; 380: 64–79
- **Combining Dynamic Rupture Simulations with Ground-Motion Data to Characterize Seismic Hazard from M-w 3 to 5.8 Earthquakes in Oklahoma and Kansas** *BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA*
  Bydlon, S. A., Withers, K. B., Dunham, E. M.
  2019; 109 (2): 652–71
- **What controls the initial peak of an air-gun source signature?** *GEOPHYSICS*
  Watson, L. M., Werpers, J., Dunham, E. M.
  2019; 84 (2): P27–P45
- **Tsunami Wavefield Reconstruction and Forecasting Using the Ensemble Kalman Filter** *GEOPHYSICAL RESEARCH LETTERS*
  Yang, Y., Dunham, E. M., Barnier, G., Almquist, M.
  2019; 46 (2): 853–60
- **Simulation of acoustic and flexural-gravity waves in ice-covered oceans** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Mattsson, K., Dunham, E. M., Werpers, J.
  2018; 373: 230–52
- **A finite difference method for earthquake sequences in poroelastic solids** *COMPUTATIONAL GEOSCIENCES*
  Torberntsson, K., Stiernstrom, V., Mattsson, K., Dunham, E. M.
  2018; 22 (5): 1351–70
- **Mach wave properties in the presence of source and medium heterogeneity** *GEOPHYSICAL JOURNAL INTERNATIONAL*
  Vyas, J. C., Mai, P. M., Galis, M., Dunham, E. M., Imperatori, W.
  2018; 214 (3): 2035–52
- **Earthquake cycle simulations with rate-and-state friction and power-law viscoelasticity** *TECTONOPHYSICS*

Allison, K. L., Dunham, E. M.
2018; 733: 232–56

- **A Suite of Exercises for Verifying Dynamic Earthquake Rupture Codes** *SEISMOLOGICAL RESEARCH LETTERS*
  Harris, R. A., Barall, M., Aagaard, B., Ma, S., Roten, D., Olsen, K., Duan, B., Liu, D., Luo, B., Bai, K., Ampuero, J., Kaneko, Y., Gabriel, et al
  2018; 89 (3): 1146–62
- **Forecasting the Eruption of an Open-Vent Volcano Using Resonant Infrasound Tones** *GEOPHYSICAL RESEARCH LETTERS*
  Johnson, J. B., Watson, L. M., Palma, J. L., Dunham, E. M., Anderson, J. F.
  2018; 45 (5): 2213–20
- **Accounting for Fault Roughness in Pseudo-Dynamic Ground-Motion Simulations** *PURE AND APPLIED GEOPHYSICS*
  Mai, P., Galis, M., Thingbaijam, K. K. S., Vyas, J. C., Dunham, E. M.
  2017; 174 (9): 3419–50
- **Treatment of the polar coordinate singularity in axisymmetric wave propagation using high-order summation-by-parts operators on a staggered grid** *COMPUTERS & FLUIDS*
  Prochnow, B., O'Reilly, O., Dunham, E. M., Petersson, N. A.
  2017; 149: 138-149
- **Slow-slip events on the Whillans Ice Plain, Antarctica, described using rate-and-state friction as an ice stream sliding law** *JOURNAL OF GEOPHYSICAL RESEARCH-EARTH SURFACE*
  Lipovsky, B. P., Dunham, E. M.
  2017; 122 (4): 973-1003
- **The effect of compliant prisms on subduction zone earthquakes and tsunamis** *EARTH AND PLANETARY SCIENCE LETTERS*
  Lotto, G. C., Dunham, E. M., Jeppson, T. N., Tobin, H. J.
  2017; 458: 213-222
- **Excitation and resonance of acoustic-gravity waves in a column of stratified, bubbly magma** *JOURNAL OF FLUID MECHANICS*
  Karlstrom, L., Dunham, E. M.
  2016; 797: 431-470
- **Dynamic earthquake rupture simulations on nonplanar faults embedded in 3D geometrically complex, heterogeneous elastic solids** *JOURNAL OF COMPUTATIONAL PHYSICS*
  Duru, K., Dunham, E. M.
  2016; 305: 185-207
- **Rupture complexity and the supershear transition on rough faults** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Bruhat, L., Fang, Z., Dunham, E. M.
  2016; 121 (1): 210-224
- **Tremor during ice-stream stick slip** *CRYOSPHERE*
  Lipovsky, B. P., Dunham, E. M.
  2016; 10 (1): 385-399
- **Nucleation and dynamic rupture on weakly stressed faults sustained by thermal pressurization** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Schmitt, S. V., Segall, P., Dunham, E. M.
  2015; 120 (11): 7606-7640
- **High-order finite difference modeling of tsunami generation in a compressible ocean from offshore earthquakes** *COMPUTATIONAL GEOSCIENCES*
  Lotto, G. C., Dunham, E. M.
  2015; 19 (2): 327-340
- **Rupture dynamics and ground motions from earthquakes in 2-D heterogeneous media** *GEOPHYSICAL RESEARCH LETTERS*
  Bydlon, S. A., Dunham, E. M.
  2015; 42 (6): 1701-1709

- **Vibrationalmodes of hydraulic fractures: Inference of fracture geometry fromresonant frequencies and attenuation** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Lipovsky, B. P., Dunham, E. M.
  2015; 120 (2): 1080-1107
- **Simulation of Earthquake Rupture Dynamics in Complex Geometries Using Coupled Finite Difference and Finite Volume Methods** *COMMUNICATIONS IN COMPUTATIONAL PHYSICS*
  O'Reilly, O., Nordstrom, J., Kozdon, J. E., Dunham, E. M.
  2015; 17 (2): 337-370
- **Constraining shallow slip and tsunami excitation in megathrust ruptures using seismic and ocean acoustic waves recorded on ocean-bottom sensor networks** *EARTH AND PLANETARY SCIENCE LETTERS*
  Kozdon, J. E., Dunham, E. M.
  2014; 396: 56-65
- **An efficient numerical method for earthquake cycles in heterogeneous media: Alternating subbasin and surface-rupturing events on faults crossing a sedimentary basin** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Erickson, B. A., Dunham, E. M.
  2014; 119 (4): 3290-3316
- **A 2D Pseudodynamic Rupture Model Generator for Earthquakes on Geometrically Complex Faults** *BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA*
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